I-TECH
MEDICAL DIVISION

OPERATING MANUAL

MNPG178 Rev. 1 of 25/03/15

I-TECH

PHYSIO 4/EMG

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Manufacturer

I.A.C.E.R. S.r.l.

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IACER S.r.l. is an Italian manufacturer of medical devices (CE certificate n° MED24021 released by the Notified Body n°0476 Cermet).

Declaration of conformity

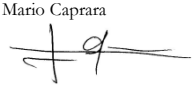
IACER S.r.l., headquartered in Italy, via S. Pertini 24/A 30030 Martellago (VE), declares that the I-TECH PHYSIO 4/4/EMG device is manufactured in conformity with Council Directive 93/42/EEC (MDD) dated 14 June 1993 (Italian Legislative Decree 46/97 dated 24 February 1997 "Attuazione della Direttiva 93/42/CEE concernente i dispositivi medici"), Annex II as amended by Directive 2007/47/EC dated 5 September 2007 (Italian Legislative Decree 37/2010 dated 25 January 2010)

Notified body: Cermet, Via di Cadriano 23 – 40057 Cadriano di Granarolo (BO) ITALY

I-TECH PHYSIO 4/4/EMG is Class IIa equipment, with reference to Directive 93/42/EEC (MDD), annex IX rules 9 and 10 (and subsequent amendments).
Certification channel: Annex II (excluding paragraph 4)

Martellago, 01/09/2014

The legal representative
Mario Caprara



Classifications

The I-TECH PHYSIO 4/EMG device has the following classification:

- Class IIa equipment (Directive 93/42/EEC, annex IX, rules 9 and 10 and subsequent amendments);
- Class II with BF type applied part (Classif. IEC EN 60601-1);
- Equipment unsuitable for use in the presence of a flammable anaesthetic mixture containing air, oxygen or nitrous oxide;
- Equipment suitable for continuous operation;
- Equipment unsuitable for use outdoors.

Purpose and scope

Clinical scope:	Therapeutic
Purpose:	Outpatient care/Hospital care

The medical device is intended for use by a therapist, a fitness coach at a public/private centre or clinic, or professional operators in general.

The I-TECH PHYSIO 4 and I-TECH PHYSIO EMG are intended in particular for muscular rehabilitation in general, muscular cool-down, muscle strengthening, beauty treatments (firming and drainage), pain therapy (analgesic and muscular atrophy programs) and functional recovery of muscles after trauma or an accident, specific programs for ionophoresis, incontinence and the treatment of denervated muscles.

It is possible, therefore, to treat a wide range of both chronic and acute pathologies.

The I-TECH PHYSIO 4/EMG model permits the non-invasive registration of surface electromyographic (sEMG) signals taken in single differential mode and detected with electrodes placed on the skin. The user must be familiar with sEMG techniques in order to put the I-TECH PHYSIO 4/EMG to correct use.

The CE0476 marking on the device applies exclusively to medical programs and does not cover, therefore, any programs relating to beauty treatments. Refer to the details of the various programs for further information.

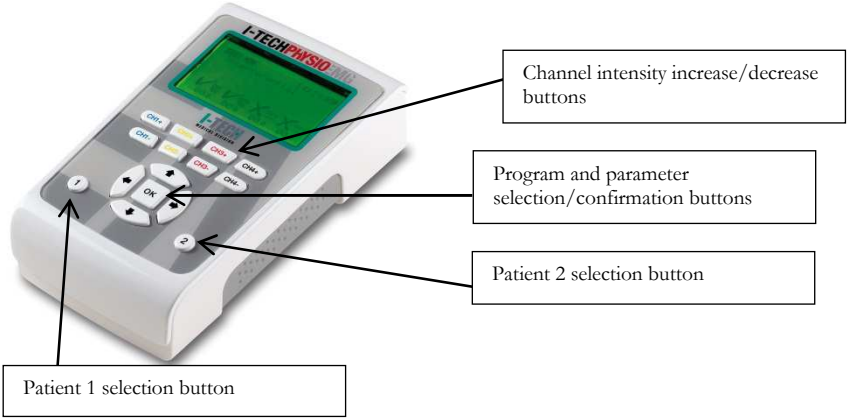
Technical specifications

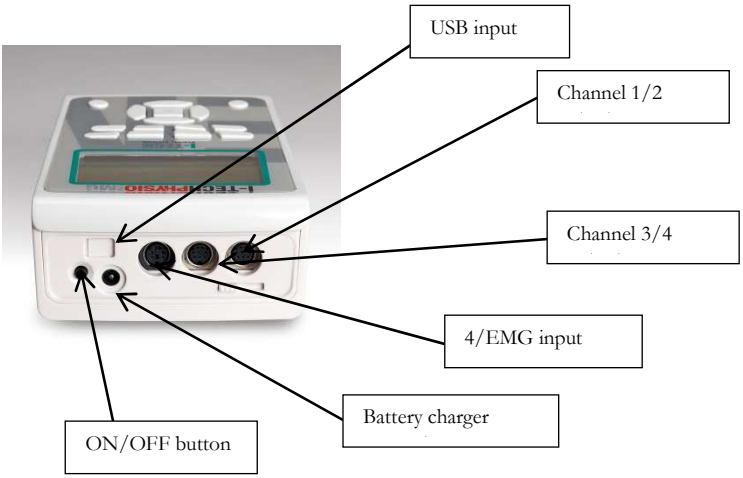
Characteristic	Specification
Power supply	NiMH 7.2V 2000mAh (6xAA Size) pack of rechargeable batteries. EA1018G-12V battery charger, 100/240VAC 1.0A 50/60Hz input, 12VDC 2.0A output. Non-replaceable 2A 250VAC fuse.
Max absorbed current	1.6 A
Insulation class (IEC EN 60601-1)	II
Applied part (IEC EN 60601-1)	BF
Dimensions (length x width x height) (mm)	180x110x50
IP protection	IP20. Device protected against the infiltration of solid bodies measuring more than 12.5mm in diameter. Device not protected against the infiltration of liquids.
Electrotherapy (models 4 and 4/EMG)	
Number of programs	A total of 86 programs divided as follows: - 26 TENS/ANALGESIC/IONOPHORESIS (diadynamic, faradic, Kotz and interferential currents). - 25 REHAB (denervated muscles, incontinence, pains) - 17 EMS (strengthening, heating, muscular cool-down and for beauty treatments). - 18 Customisable.
Max out	160Vpp with a load of 1000 Ohm
Frequency	Between 0.5 and 40kHz
Impulse	Between 20 microseconds and 400 milliseconds
Duration of therapy	Preset programs, free memories of up to 60 minutes
Electromyography (model 4/EMG only)	
4/EMG input dynamics	0 to 4.16 mVpp

4/EMG bandwidth	16 to 402 Hz
4/EMG input level of noise	< 3 VRMS
Gain	794 V/V
Input impedance	> 100 GΩ over the whole band
CMRR	>100 dB
Output dynamics	0 to 3.3 V
Resolution	10 bit
Sampling frequency	1024 Hz

The device comes with a 10-year warranty.

Description of the controls


Channel intensity increase/decrease buttons
Program and parameter selection/confirmation buttons
Patient 2 selection button
Patient 1 selection button



Labels

Label on the back of the device

Model I-TECH PHYSIO 4/EMG **Model I-TECH PHYSIO 4**

	Follow the instructions on use
	WEEE directive
	Class II device
	BF type applied part
CE 0476	In compliance with MDD 93/42/EEC (and subsequent amendments to Dir. 2007/47/EC concerning medical devices)
CE	CE marking
	Production data (month-year)
SN	Serial number
	Permitted temperatures (temperature range for storage, on the pack)
	Relative humidity (relative humidity for storage, on the pack)
	Manufacturer data
	Device not protected against the infiltration of liquids, keep it dry.
	Device able to supply current at above 10mA with a load of 1KOhm
EXT POWER SUPPLY	External power supply unit: EA1018G-12V battery charger, 100/240VAC 50/60Hz input, 12VDC 2 A output

Contents of the pack

The I-TECH PHYSIO 4/EMG pack contains:

- 1 x I-TECH PHYSIO 4/EMG device;
- 1 x EA1018G-1E battery charger;
- 2 x electrotherapy connection cables (yellow/blue and white/red) with 2 mm female connector, about 2.5m in length;
- 2 x ionophoresis connection cables (red and blue) with 2mm female connector, about 2.5m in length;
- 1 x EMS connection cable (blue) for tip with 2mm female connector, about 2.5m in length;
- 1 x connection cable with EMG amplifier, about 2m in length (only for the I-TECH PHYSIO EMG version);
- 2 x packs of rectangular single-patient electrotherapy electrodes;
- 2 x packs of square single-patient electrotherapy electrodes jack connection;
- 1 x pack of square single-patient electrotherapy electrodes clip (snap) connection;
- 1 x pack of round single-patient EMG electrodes (only for the I-TECH PHYSIO EMG version);
- 1 x tip for EMS stimulation, cable about 2m in length.

Purpose

Warnings

The device was designed and created for use with rechargeable internal batteries and with the battery charger included in supply.
• The long-term effects of stimulation are not known
• For external use only
• It is forbidden to position the electrodes on the carotid sinuses, especially those of patients known to have hypersensitive carotid sinuses.
• Do not carry out stimulation on the thyroid, neck or mouth because this could trigger muscle spasms that can obstruct the airways and cause breathing difficulties and heart rhythm disorders and excessive arterial pressure.
• It is forbidden to position the electrodes in such a way that the current crosses the heart area (e.g. a black electrode on the chest and a red electrode on the shoulder blade); however, electrodes can be positioned along the muscular fascia of the heart area, as for pectoral strengthening. Danger of cardiac arrhythmia.
• Do not carry out stimulation with the patient connected to high frequency surgical devices as this could cause scalding and skin injuries under the electrodes and problems with the stimulator.
• Do not use the device with short-wave or micro-wave electrosurgical or therapy equipment that sends electrical impulses to the body as this could cause problems with the stimulator.
• It is forbidden to use the device near flammable substances or in environments where there is a high concentration of oxygen, in the presence of aerosol devices or in very damp environments (do not use it in the bathroom or when having a shower/bath).
• It is forbidden to position the electrodes near the eyes; make sure that the current delivered does not cross the eyeball (one electrode diametrically opposite to the other in relation to the eye); keep a distance of at least 3cm from the eyeball.
• Do not use it in the area of the genitals
• Do not use it in areas of the body of little sensitivity.
• Do not allow the equipment to be used by people with emotional disorders or who are even only temporarily incapacitated or have insufficient mental ability.
• Apply the electrodes only on clean, unblemished skin.
• Keep the electrodes separate during operation: electrodes in contact can cause inappropriate stimulation or skin injuries.
• Keep out of the reach of children.

• Consult your doctor if you have any doubts about using the device.
• Use of the device is prohibited in the presence of signs of deterioration of the device itself and of the electrodes and cables. Always check the condition of the device before use.
• In the case of metal osteosynthesis implants, consult a doctor before using the device.

Make sure that the plug and battery charger are intact. Should one of these parts show any sign of damage, suspend use of the battery charger immediately and contact the retailer or manufacturer.
Only use battery chargers supplied by the manufacturer; the use of battery chargers not supplied by the manufacturer will free the same from any responsibility related to damage to the equipment or user and expose the user to potential risks like short circuits and fire.

• The device must be used with care for patients with suspected heart problems
• Some patients may suffer skin irritation or hypersensitivity due to treatment or the gel. Suspend treatment and consult a doctor if the problem persists.
• The intensity of stimulation and the position of the electrodes should be based on the indications of the prescribing doctor.
• The effectiveness of treatment depends largely on the selection of patients suited to treatment by qualified personnel.
• Ensure good contact between the skin and the electrode. Prolonged use can cause irritation of the skin in the area where the electrodes are applied.
• If the intensity of stimulation is uncomfortable or becomes inadequate, reduce the intensity to an adequate level. Consult your doctor if the problem persists.
• Do not use the device when driving a vehicle or when handling and controlling equipment/machinery.
• Do not confuse the connection cables with the cables of headsets or other devices, and do not connect the cables/electrodes to other equipment.
• Do not use sharp or pointed objects on the device's keyboard.
• Use only accessories provided by the manufacturer.

Warning: the equipment delivers current in excess of 10mA.

The manufacturer assumes responsibility for the quality, efficiency and safety of the equipment only when:

- any additions, modifications and/or repairs are carried out by authorised personnel;
- the equipment is used observing the instructions on use in this manual.

WARNING: it is forbidden to tamper with this equipment in any way.

Side effects

No significant side effects are known. Some particularly sensitive people have reported skin redness in the area where the electrodes were positioned: redness normally vanishes a few minutes after treatment. Should the redness persist please consult a doctor.
In rare cases, stimulation carried out in the evening can cause some people to experience difficulty in falling asleep. Suspend treatment and consult a doctor if this occurs.

Contraindications

Do not use the device when there are cancerous lesions in the area of treatment. Stimulation must not be carried out in areas that are infected, swollen or inflamed, or when there are skin eruptions (phlebitis, thrombophlebitis, etc.).
This device must not be used by people with a pace-maker, epileptics, pregnant women, anxious people or people suffering from serious illnesses or inguinal or abdominal hernias.
Do not use the device if the cause of pain is not known or not diagnosed. Use the device only after diagnosing the cause. In the event of injury, muscle stress or any other health problem use the device only under medical supervision.

Electromagnetic interference

The device doesn't produce or receive electromagnetic interference from other devices. However it is recommended to keep a distance of at least 3 metres from televisions, monitors, mobile phones or other electronic devices.
The equipment must not be used near or on top of other equipment. If this is not avoidable, the operator must monitor normal operation of the equipment in its current configuration.
Please refer to the EMC tables annexed to this manual for further details.

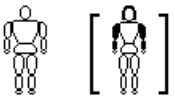
Instructions on use for electrotherapy treatments

Before using I-TECH PHYSIO 4/EMG clean the skin of the area to be treated; with the cable disconnected from I-TECH PHYSIO 4/EMG, connect the electrostimulation cable jacks to the self-adhesive electrodes; position the self-adhesive electrodes on the skin (see photographs of electrode positions); connect the impulse transmission cables to the relative jacks (Channel 1 and/or Channel 2), then turn on the device.

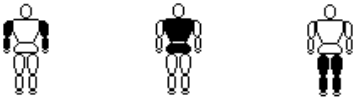
Instructions on use for a single patient.

1. Turn on the I-TECH PHYSIO 4/EMG by pressing the ON/OFF switch on the small rear panel of the device.
2. Select single mode and press the OK key to confirm
3. Select the program group: Wave, Rehab, EMS or Mem, using the left and/or right arrow keys .
4. Select the program using the up/down arrow buttons (e.g. E03 basic strength).
5. Select male or female with the left/right arrow buttons (when applicable) .

Select male

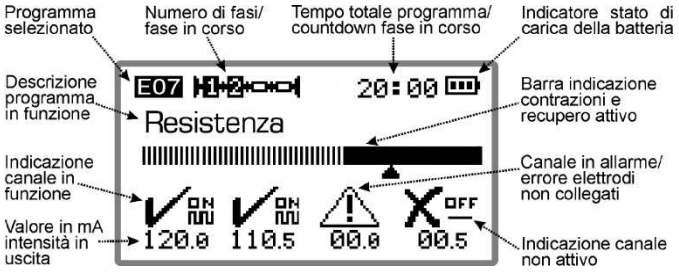

Select female

6. Select the muscle group with the up/down arrow buttons.


arms, male | trunk, male | legs, male

arms, female | trunk, female | legs, female

7. Press the OK key to start stimulation and the relative text appears on the screen; place the electrodes on the skin, connect the cables, and increase the intensity; the type of cable required for the selected type of treatment also appears on the screen. To start the work session, press the Up arrow key of at least one of the channels used for electrostimulation, and increase the intensity of the output current; the I-TECH PHYSIO 4/EMG opens the work screen automatically, displaying the name of the selected program.
8. Press the up arrow button for each channel in use to increase current intensity until the personal tolerance level is reached.



A bar indicating the start and end of a contraction will appear on the display while the electronic stimulator is working. The periods of muscular contraction (bold bar) and the periods of recovery (dotted or striped bar) are graphically visualised under the bar with a cursor. This enables the user to know exactly when a contraction starts.

9. At the end of the first phase, the I-TECH PHYSIO 4/EMG cancels the previously selected intensity, and warns the user with an intermittent signal; to continue with the program, increase the intensity again. Three sound signals will advise of the end of the program.
   At the end of the program, switch off the I-TECH PHYSIO 4/EMG and remove the cables. Attach the electrodes to the transparent films and put them in their original packaging.

Option to simultaneously increase the intensity on all 4 channels:
Select the desired program as instructed above.
Increase the intensity of all the channels up to at least 1 by pressing the relative keys, and then press the Up arrow keys to increase the intensity for all 4 channels. To decrease the intensity, press the Down arrow keys.

Skip phase control:
Press the right arrow button during normal program operation to skip to the next phase.

Pause/stop program control:
During normal program operation, press the OK button once to momentarily pause the normal work cycle. Press the OK button again to restart the program.
Press the OK button twice consecutively to stop the program.

Instructions on use for two patients.

1. Turn on the I-TECH PHYSIO 4/EMG by pressing the ON/OFF switch on the small rear panel of the device.
2. Select two patient mode and press the OK key to confirm.
3. Next, select the program required for patient 1 following the instructions above.
4. Press key 2 to set the program and make the relative adjustments for patient 2.

During therapy, it is possible to switch between patient 1 and patient 2 at any time by pressing key 1 or 2 on the keyboard.

Electrostimulation and stimulation intensities.

Electrostimulation consists of the transmission of electric micro-impulses from the I-TECH PHYSIO 4/EMG to the human body.

The fields of application of electrostimulation are: pain therapy, recovery of muscle trophism after injury or a surgical operation, athletic preparation and beauty treatments.

Specific electric impulses are used for every one of these applications.

The stimulation intensity is shown for each channel, on a scale of 0 to 120mA, on the screen of the I-TECH PHYSIO 4/EMG. For Sport and Beauty programs, the intensity differs according to the type of muscle or the program in use. The following description helps the user to choose the correct intensity according to impulse.

Impulse categories are:

Tens impulse: for tens programs, the intensity should be set at a level between the thresholds of perception and pain. The maximum limit is reached when the muscles surrounding the area treated begin to contract. It is best to stay below that limit.

Micro-current impulse: the maximum adjustable intensity is 12, so very low.It can be set between 6 and 12 and may be barely perceivable: this is not a fault, but quite normal for the program.

Ionophoresis impulse: the intensity must be strong enough to produce a relevant perception, near pain, till the muscles surrounding the area treated begin to contract. Maximum adjustable intensity: 50.

EMS impulse: in this case the intensity is raised a little at a time to stimulate and gradually increase the metabolism of the treated muscle. A comparison could be drawn with a car: the engine needs to warm up before it can be run at maximum speed.

Toning, training and atrophying contraction impulse:the muscle treated must visibly contract during a training impulse.The fact that the muscle tends to stiffen and increase in volume will be visible to the naked eye. Intensity should be increased gradually (in the first contraction) to enable you to identify the right level of stimulation comfort. Intensity can be increased up to the personal tolerance threshold during the second training contraction; this operation is then repeated during each contraction until the workload reaches the level of intensity recommended in the description of the single programs. We recommend that you record the level of intensity reached in order to try to improve the level of stimulation and consequently your performance.

Massage, winding down, active recovery impulse: the intensity must be adjusted gradually to massage the treated muscle. The level of intensity should be sufficient to obtain a comfortable massage. Bear in mind that there is no need to endure high levels of intensity in this case as it is meant to be a massage, meaning that intensity can be increased gradually and not to an excessive degree.

Capillarisation impulse: increase the intensity gradually to produce constant, visible stimulation of the treated area; a medium stimulation threshold is recommended, always below the pain threshold.

Lipolysis/drainage impulse: the "pump" effect is produced by sequential tonic contractions. The intensity must be sufficient to produce these contractions: the greater the contraction, the greater the induced pump effect. There is no benefit to be gained from enduring intensity high enough to cause pain. The first electrostimulation sessions should be carried out at a low intensity to allow the organism to get used to new sensations. In this way intensity can be increased gradually without causing any trauma.

Other impulses: see program details.

WAVE programs.

⚠ WARNING!

It must be remembered that an electronic stimulator is a very effective analgesic instrument and that pain can indicate various types of medical condition!
Most of the programs described in this section are analgesic. You are advised to read the manual carefully before using the I-TECH PHYSIO 4/EMG.

TENS, an acronym standing for "transcutaneous electrical nerve stimulation", is a therapeutic technique mainly used for analgesic purposes to counter the effects (usually pain) of a wide variety of medical conditions: cervical pans, arthritis, myalgia, neuritis, back pains, periarthritis, heaviness in the legs and muscular weakness, to mention but a few.
On an academic level, TENS can be divided into various categories according to the mechanism used to reduce the pain. The main types are: conventional TENS (or fast analgesic), electro acupuncture training TENS (or delayed analgesic), TENS sequential where stimulation parameters are modified automatically by the program itself during the treatment, TENS at maximum values with antidromic action and consequently an immediate local anaesthetic effect, TENS burst that combines conventional and electro acupuncture training TENS.
The rehabilitative action of TENS is represented by its power to reduce pain thereby restoring physiological conditions; more often than not this allows the patient to regain normal motor function. Consider a patient suffering from irritating periarthritis; they either resort to using analgesics or learn to live with the pain that often makes even the simplest movements impossible. Immobility reduces metabolic activity making it impossible to eliminate algogenic substances. So a vicious circle begins. In addition to relieving pain, TENS causes induced muscle stimulation increasing metabolic activity and blood flow and improving tissue oxygenation with an intake of nutritional substances. So the positive effect can be amplified by combining TENS with muscle stimulation of the area concerned.

Position of electrodes and intensity levels.
The electrodes should be positioned to form a square surrounding the painful area using Channel 1 and Channel 2 as shown in figure 1 (positioning of the red electrode at the top/black one at the bottom is irrespective of the type of therapy, refer to the manual of electrode positions) Intensity adjusted to a level between the thresholds of perception and pain: the maximum intensity level is the moment in which the muscles surrounding the area treated begin to contract; over this limit stimulation does not become more effective, just more irritating, so it is best to stop before that point.

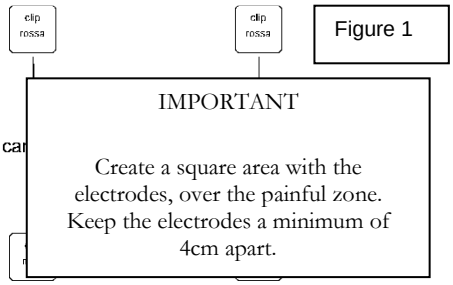

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Figure 1
IMPORTANT
Create a square area with the electrodes, over the painful zone. Keep the electrodes a minimum of 4cm apart.

W01 • Rapid TENS. (Medical program).
Program also called conventional tens, used for analgesic purposes; its purpose is to induce the organism into blocking pain at the spine, in accordance with the "Gate Control Theory" by Melzack and Wall. Pain impulses leave part of the body (for example the hand) and run along the nerve tracts (through small-diameter nerve fibres) until they reach the central nervous system where the impulses are interpreted as pain. Conventional tens activates large-diameter nerve fibres, blocking the path of

small-diameter nerve fibres at the spine. It therefore acts mainly on the symptom: to simplify it further, the wire transmitting pain information is obstructed.
Treatment duration should be no less than 30/40 minutes. Conventional tens is a current that can be used to treat general everyday pain. The first benefits can be seen after an average of 12 to 15 treatments carried out on a daily basis (there are no contraindications for up to double this amount).
The program has a duration of 30 minutes in a single phase. The program can be repeated at the end of the session for particularly persistent pain.
Position of electrodes: form a square above the painful area as shown in figure 1.
Intensity adjusted to a level between the thresholds of perception and pain: the maximum intensity level is the moment in which the muscles surrounding the area treated begin to contract (over this limit stimulation does not become more effective, just more irritating, so it is best to stop before that point).

W02 • Endorphinic TENS 0.5 Hz Frequency. (Medical program).
This type of stimulation produces two effects in relation to the position of the electrodes: positioning the electrodes in the dorsal region, see photograph 08 in the positions manual, promotes the endogenous production of morphine-like substances capable of raising the pain perception threshold; positioning the electrodes to form a square above the painful area as shown in figure 1 produces a vascularising effect. Vascularisation increases arterial flow and consequently aids the removal of algogenic substances and helps to restore normal physiological conditions.
Treatment duration 20 minutes in a single phase, daily frequency.
Do not position the electrodes close to inflamed areas.
Intensity adjusted for good solicitation of the part stimulated (15÷30), the sensation must be similar to that of a massage.

W03 • Endorphinic TENS 1 Hz Frequency. (Medical program).
See previous program description, but with 1 Hz frequency.

W04 • Endorphinic TENS 2 Hz Frequency. (Medical program).
See previous program description, but with 2Hz frequency.

W05 • TENS sequential. (Medical program).
The action of this program is very similar to that of the W01 program. During stimulation, this program modifies the frequency and impulse width in order to prevent inurement to the stimulation (no need to continuously adjust the intensity value). Select the intensity at the beginning of the program and maintain it until the end of the program: set it in order to produce a slight tingling effect in the treated area. If the perception of current decreases a lot during the program, do not increase the intensity value and wait until the end of therapy. The TENS program is working properly.
Program duration: 20 minutes for each phase. Intensity: set above the threshold of perception.
Position of electrodes: form a square on the painful area as shown in figure 1 or see photographs 25 to 33.

W06 • TENS at maximum values. (Medical program).
Very short duration, 3 minutes. Blocks pain impulses peripherally creating a proper anaesthetising effect in the area treated. This type of stimulation is suitable for injuries or bruises when rapid action is required. The intensity selected is the maximum tolerable value (well in excess of conventional tens, and therefore with considerable contraction of the muscles surrounding the area treated). That is the reason why such stimulation is undoubtedly the least tolerated but is extremely effective. This type of stimulation is not recommended for particularly sensitive people and in any case the electrodes should not be positioned in sensitive areas such as the face and genitals or close to wounds.
Position of electrodes: form a square on the painful area as shown in figure 1 or see photographs 25 to 33.

W07 • TENS Burst impulse. (Medical program).

This program produces a training effect using the frequencies of conventional TENS. Useful for pain therapy. The action is similar to the one of endorphinic TENS, with a treatment time of 15 minutes for a phase.

Position of electrodes: form a square on the painful area as shown in figure 1.

Intensity adjusted for good solicitation of the part stimulated (15÷30mA), the sensation must be similar to that of a massage.

W08 • Microcurrent (MENS). (Medical program).

MENS releases a very low and barely perceivable current. The main features of MENS are:

correct body bioelectric currents when they have been altered by diseases;

analgesic action;

ATP production (ATP production promotes proteins synthesis and faster healing of wounds);

reduction of oedema: MENS is able to reduce vascular permeability with an improvement of lymphatic activity.

It is a program suitable for more delicate parts of the body (face, close to genitals, inflamed areas) or for people that don't tolerate conventional TENS very well. Program duration: 30 minutes. Maximum intensity limited to 12. We recommend to set the intensity level between 6 and 12.

Table of correspondences adjusted/effective current:

Adjusted intensity displayed on screen	Effective current
0.5	0.15 mA
1	0.30 mA
3	0.90 mA
5	1.5 mA
9	2.7 mA
12	3.6 mA

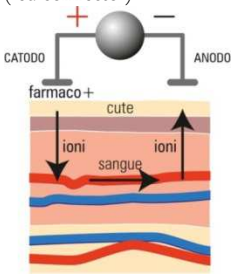
W09-W10 • Ionophoresis 1 / Ionophoresis 2. (Medical program).

Ionophoresis is an electrotherapeutic technique that uses continuous current to carry drugs into a painful area or contracture area. Ionophoresis means "transfer of ions": a continuous current transfers active pharmacologic ions through the skin. The electric current favours the penetration of the drug into the cells, and at the same time it stimulates the elimination of metabolic slag.

The drug can have negative polarity, positive polarity or double polarity. The current induces the drug to run from one pole to the other, crossing the painful area and releasing the specific active ingredient.

WARNING: before starting the therapy, wet the sponge electrodes and wring them to avoid dripping, then put the drug on the electrode as follows:

Drugs with positive polarity: dissolve this type of drug on the electrode connected to the positive pole (red connector).



Drugs with negative polarity: dissolve this type of drug on the electrode connected to the negative pole (black connector).

Two-pole drugs: these can be dissolved on either the positive pole or the negative pole.

Position the electrode with the drug on the painful area, and the other electrode on the other side.

Program duration: 20 minutes. Select channel 1 or channel 2 (select both channels only if you need to stimulate two different areas). Position the electrodes (positive and negative) horizontally to the treatment area. Channels 3 and 4 are disconnected. Set an intensity

value to create the tingling effect in the treatment area. At the end of the program, the skin could turn slightly red; any reddening usually vanishes a few minutes after the end of the program.
Program 1 works at 1000 Hz frequency, program 2 at 1500 Hz. Program 2 has a higher transfer capacity than program 1, but also involves a higher probability of reddening of the skin. Do not use the ionophoresis program near metallic prostheses!

W09 and W10 programs differ only in terms of the level of frequency. The second program works at a frequency higher than the first so it is better at transferring active principles. On the other hand, this aspect can cause greater irritability of the skin. In the case of the W10 program, it is advisable to check for reddening of the skin 5 minutes into treatment (stop the program and remove the electrodes to check the skin): in the case of excessive reddening, use program W09 instead.

Ionophoresis is also used for the treatment of diseases affecting the urogenital male apparatus, like IPP (Induratio Penis Plastica) or La Peyronie disease.
Consult a specialist before starting the therapy.
Contact the manufacturer for other information.

W11 • Haematomas. (Medical program).
Consult a doctor before using this program to treat haematomas. Total program duration: 20 minutes in a single phase. Few applications carried out within a few hours of the bruise. A combination of various types of square-wave impulses has a graduated draining effect on the area to be treated (impulses at different frequencies drain the area at different depths). Intensity: should be adjusted to a level between the thresholds of perception and pain.
Position of electrodes: form a square above the area to be treated as shown in figure 1 page 12.

W12 • Oedema. (Medical program).
Consult a doctor before using this program to treat oedemas. Total program duration: 15 minutes in a single phase. A combination of various types of square-wave impulses has a graduated draining effect on the area to be treated (impulses at different frequencies drain the area at different depths). Intensity: should be adjusted to a level between the thresholds of perception and pain.
Position of electrodes: form a square above the area to be treated as shown in figure 1 page 12.

DIADYNAMIC CURRENTS

Diadynamic currents are composed of waves with unidirectional and always positive impulses. These kind of waves derive from electrical sine waves (low frequency) that have been previously combined and modulated.
Diadynamic currents are indicated for the treatment of tendinitis (of the elbow, wrist, shoulders, knee and ankle), articular traumas, acute and chronic articular diseases and muscular pains.

W13 • MF Diadynamic. (Medical program).
It is a sinusoidal single-phase current with pulse trains of 10ms and a 10ms pause at 50 Hz. The main effect of this kind of current is an excitomotor action on striated muscle and on motor nerves, but it also has an analgesic, tonic and vasodilatory effect. The analgesic effect is delayed and continuous. Indications: It is indicated as therapy for painful non-spastic conditions and to improve the tonicity of the connective tissue of muscles. Total program duration: 15 minutes in a single phase. Intensity: should be adjusted to a level between the thresholds of perception and pain.
Position of electrodes: form a square above the area to be treated as shown in figure 1 page 12.

W14 • MFSR Diadynamic. (Medical program).
It is a sinusoidal single-phase current with pulse trains of 10ms and a 10ms pause, with 2 seconds of action and a 1 second pause at 50 Hz. The main effect of this kind of current is an excitomotor action on striated muscle and on motor nerves, but it also has an analgesic, tonic and vasodilatory effect. The analgesic effect is delayed and continuous. Indications: It is indicated as therapy for painful non-

spastic conditions and to improve the tonicity of the connective tissue of muscles. Total program duration: 15 minutes in a single phase. Intensity: should be adjusted to a level between the thresholds of perception and pain.
Position of electrodes: form a square above the area to be treated as shown in figure 1 page 12.

W15 • MFSL Diadynamic. (Medical program).
It is a sinusoidal single-phase current with pulse trains of 10ms and a 10ms pause, with 5 seconds of action and a 2 second pause at 50 Hz. The main effect of this kind of current is an excitomotor action on striated muscle and on motor nerves, but it also has an analgesic, tonic and vasodilatory effect. The analgesic effect is delayed and continuous. Indications: It is indicated as therapy for painful non-spastic conditions and to improve the tonicity of the connective tissue of muscles. Total program duration: 15 minutes in a single phase. Intensity: should be adjusted to a level between the thresholds of perception and pain.
Position of electrodes: form a square above the area to be treated as shown in figure 1 page 12.

W16 •DF Diadynamic. (Medical program).
It is a sinusoidal single-phase current with pulse trains of 10ms and a 0ms pause at 100 Hz. Current sensibility is of course lower than MF Diadynamic thanks to its higher frequency. So its passage is more pleasant and less perceived. Physiological effects: The main action of the DF current is reduced sensibility that provokes an analgesic effect. However, the inhibitory action is hindered by rapid inurement. Moreover, it causes vasodilatation, has a sedative effect on the sympathetic nervous system and a great effect of functional and motor recovery of the muscle. Indications: It is indicated as therapy for painful non-spastic conditions and to improve the tonicity of the connective tissue of muscles. Total program duration: 15 minutes in a single phase. Intensity: should be adjusted to a level between the thresholds of perception and pain.
Position of electrodes: form a square above the area to be treated as shown in figure 1 page 12.

W17 • DFSR Diadynamic. (Medical program).
It's a diadynamic biphasic current with 2 seconds of action and a 1 second pause at 100 Hz. The main effect of this kind of current is an excitomotor action on striated muscle and on motor nerves, but it also has an analgesic, tonic and vasodilatory effect. The analgesic effect is delayed and continuous. Indications: It is indicated as therapy for painful non-spastic conditions and to improve the tonicity of the connective tissue of muscles. Total program duration: 15 minutes in a single phase. Intensity: should be adjusted to a level between the thresholds of perception and pain.
Position of electrodes: form a square above the area to be treated as shown in figure 1 page 12.

W18 • DFSL Diadynamic. (Medical program).
It is a diadynamic biphasic current with 5 seconds of action and a 2 second pause at 100 Hz. The main effect of this kind of current is an excitomotor action on striated muscle and on motor nerves, but it also has an analgesic, tonic and vasodilatory effect. The analgesic effect is delayed and continuous. Indications: It is indicated as therapy for painful non-spastic conditions and to improve the tonicity of the connective tissue of muscles. Total program duration: 15 minutes in a single phase. Intensity: should be adjusted to a level between the thresholds of perception and pain.
Position of electrodes: form a square above the area to be treated as shown in figure 1 page 12.

W19 • CP Current. (Medical program).
It is composed of alternated single-phase (3 seconds) and biphasic (3 seconds) waveforms. The short term current has an essentially dynamogenic effect. This action promotes contraction of the striated muscles, improves the nutritional status of the tissue and facilitates the re-absorption of post-traumatic oedemas. Frequency alternating current is clearly perceptible: the DF current produces a light tremble while the MF current produces a strong pulsation.
Physiological effects: This kind of current has a strong dynamogenic effect (or trophic effect) and a great analgesic effect, especially in the case of chronic pain. Moreover, the CP current is particularly effective with regard to the re-absorption of haematomas and oedemas. Indications: It is used in the short term to treat pain resulting from the inflammation of tendons, articular capsule and soft tissues

(tendinitis, bursitis, rheumatoid arthritis and trauma in general). Total program duration: 15 minutes in a single phase. Intensity: should be adjusted to a level between the thresholds of perception and pain.
Position of electrodes: form a square above the area to be treated as shown in figure 1 page 12.

W20 • LP Current. (Medical program).
It is composed of alternated single-phase (10 seconds) and biphasic (5 seconds) waveforms. The long term current has essentially an inhibiting action on muscle and sensibility: as a consequence it produces analgesia and relaxation of the striated muscles.
Total program duration: 15 minutes in a single phase. Intensity: should be adjusted to a level between the thresholds of perception and pain.
Position of electrodes: form a square above the area to be treated as shown in figure 1 page 12.

W21 • HVPC. (Medical program).
HVPC can be used for the reconstruction of tissue, the re-absorption of oedemas and the reduction of pain.
For repairing tissue, place a sterile gauze dampened with a saline solution on the wound: if the anode (positive electrode) is placed over the wound, the migration of vascular cells and the synthesis of collagen occur, increasing the speed of recovery. If the cathode (negative electrode) is placed over the wound, a bactericide effect occurs and the growth of pathogenic microorganisms is delayed.
Total program duration: 15 minutes in a single phase. Intensity: should be adjusted to a level between the thresholds of perception and pain.
Position of electrodes: form a square above the area to be treated as shown in figure 1 page 12.

W22 • Kotz Current. (Medical program)
The Kotz current was discovered by Y. M. Kotz in the 1970s. It is a middle-frequency current and is used for the strengthening of normally innervated muscle. A 2.5 kHz interrupted carrier current is used. It is characterised by 10ms packages with 10ms pauses in between; therefore 50 packages of impulses are supplied per second. The program consists of 10 seconds of stimulation (with the aforementioned parameters) and 20 seconds of rest. Total program duration: 10 minutes.
The Kotz excitomotor effect occurs in deep muscles because of their lower resistance. In fact it has been demonstrated that the electrical impedance skin decreases with an increase in frequency.
Intensity: adjusted in order to produce good contractions of muscles stimulated at the pain threshold. Maximum adjustable intensity: 50. The intensity is adjustable only during the 10 seconds of the supply of impulses and not during the OFF phase.
Active channels: Ch1 and Ch2.
Position of electrodes: see photographs 01 to 22.

NEOFARADIC CURRENT

The neofaradic current is used for the stimulation of normal muscle. It is suitable for treating muscular hypotrophy, and the contraction of muscles also has a positive effect on bones and articular circulation.
The programs W23, W24 and W25 are composed of 2 phases:
The first phase lasts 33 seconds and is for selecting the intensity of contraction. When the desired level is reached, press the RIGHT ARROW key to confirm. Next, press the intensity increase key of any channel: phase 2 will begin automatically at the selected intensity (90% first turn, 95% second turn, 100% third turn).
The second phase lasts 15 minutes and it alternates 10 seconds of recovery with 5 seconds of contraction.

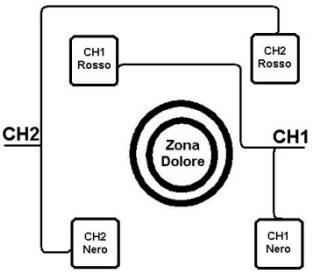
W23, W24, W25 Neofaradic 20, 50, 100 Hz	Total program duration: 15 min 33 sec
Position of electrodes: photographs 01 to 22	
Phase 1	Phase 2
Test phase duration 33 seconds	Work duration 15 minutes

W23 • Neofaradic 20 Hz. (Medical program)
It is a low frequency (20 Hz) current that is used to produce individual muscular contractions. It consists of 5 seconds of stimulation and a 10 second pause.
Intensity: adjusted for good contraction of the muscles stimulated.

W24 • Neofaradic 50 Hz. (Medical program)
It is a middle frequency current (50 Hz) used to obtain muscular tetanus; it consists of 5 seconds of stimulation and a 10 second pause.
Intensity: adjusted in order to produce good contractions of muscles stimulated almost at the pain threshold.

W25 • Neofaradic 100 Hz. (Medical program)
It is a high frequency current (100 Hz) used to obtain muscular tetanus; it consists of 5 seconds of stimulation and a 10 second pause.
Intensity: adjusted in order to produce good contractions of muscles stimulated at the pain threshold.

W26 • Interferential. (Medical program)
Interferential therapy is based on the interference of two sinusoidal currents at different frequencies applied to the patient; the resultant current, endogenously generated, is a new kind of current. Its frequencies are respectively the difference and the sum of the two initial frequencies and their multiples.
There are several advantages to this current: easy transfer through the skin, no sensation of pain for the patient, an excellent therapeutic effect in depth, no electrolytic effects.
Position of electrodes: see following figure.
Intensity: adjusted in order to produce a good tingling, not painful.



REHAB programs.

R01 • Denervated. (Medical program)
This program is specifically indicated for the treatment of denervated muscles, i.e. with complete rupturing of the peripheral nerve. In this case it is not possible to stimulate the muscle through its nerve fibres: it is necessary, instead, to stimulate the muscle fibres directly.
Impulses have a longer duration (calculated in milliseconds and not in microseconds as in the case of normal innervated muscle) and a much lower frequency.
The recommended intensity should be adjusted to stimulate the muscle with a short contraction every 2 seconds. Program duration: 20 minutes in a single phase.
Position of electrodes: use 2 big electrodes, better if wet and in a sponge, placed at the two ends of the muscle to be treated.

R02 • Partially denervated. (Medical program)
This program is specifically indicated for the treatment of partially denervated muscles, i.e. with partial rupturing of the peripheral nerve. The purpose of the program is to stimulate the healthy innervated part of the muscle. The intensity should be adjusted in order to produce a good contraction of the treated muscle.
Program duration: 20 minutes in a single phase.
Position of electrodes: see photographs 01 to 22.

WARNING: In the case of the programs R01 and R02 we recommend rectangular electrodes (measuring 50x90 mm) for medium-high intensities. With smaller electrodes, the device could generate an alarm and, therefore, not perform the treatment correctly.

R03 • Stress Incontinence. (Medical program).
Program duration 13 minutes, intensity set above the threshold of perception to produce light internal stimulation.
This program, for which no photographs are provided regarding the position of the electrodes, requires the use of appropriate internal stimulation probes, supplied separately together with the relative instructions.
We recommend that you consult your doctor before using this program and during the treatment.

R04 • Urgency Incontinence. (Medical program).
Program duration 13 minutes, intensity set above the threshold of perception to produce light internal stimulation.
This program, for which no photographs are provided regarding the position of the electrodes, requires the use of appropriate internal stimulation probes, supplied separately together with the relative instructions.
We recommend that you consult your doctor before using this program and during the treatment.

R05 • Mixed Incontinence. (Medical program).
Program duration 13 minutes, intensity set above the threshold of perception to produce light internal stimulation.
This program, for which no photographs are provided regarding the position of the electrodes, requires the use of appropriate internal stimulation probes, supplied separately together with the relative instructions.
We recommend that you consult your doctor before using this program and during the treatment.

WARNING: in the case of the programs R03, R04 and R05, we recommend certified probes (class IIa medical devices). The datasheet of the probes must contain information on use, storage and cleaning precautions and any other useful information.

R06 • Anti-inflammatory. (Medical program).
Program recommended for inflammatory conditions. Apply until the inflammatory state is reduced. Up to 2 treatments daily if required. Intensity adjusted just above the threshold of perception. Identify the area to be treated and position the electrodes as shown in figure 1 page 12.
Program duration: 30 minutes in a single phase.

R07 • Neck pain / Headache. (Medical program).
Specific program for the treatment of pain in the neck area.
Intensity adjusted to a level between the thresholds of perception and pain: the maximum intensity level is the moment in which the muscles surrounding the area treated begin to contract. The first benefits can be seen after 10 to 12 treatments carried out on a daily basis; proceed with the treatment until the symptoms pass.

R07 Neck pain/Headache	Total program duration: 33 minutes
Position of electrodes: cervical (see photograph 25).	
Phase 1	Phase 2
Short width Tens impulse 30 min.	De-contracting 3 min.

R08 • Backache/Sciatic pain. (Medical program).
Specific program for the treatment of pain in the lumbar area or along the sciatic nerve, or both. Intensity adjusted to a level between the thresholds of perception and pain: the maximum intensity level is the moment in which the muscles surrounding the area treated begin to contract; over this limit stimulation does not become more effective, just more irritating, so it is best to stop before that point. The first benefits can be seen after 12 to 15 treatments carried out on a daily basis; proceed with the treatment until the symptoms pass.

R08 Backache/Sciatic pain	Total program duration: 35 minutes
Position of electrodes: dorsal/paravertebral (photograph 10), lumbar area (photograph 27), sciatic area (photograph 28).	
Phase 1	Phase 2
Short width Tens impulse 30 min.	Tens Burst impulse 5 min.

R09 • Sprains / Bruises. (Medical program).
The program effectively inhibits localised pain caused by this type of injury. Intensity: should be adjusted to a level between the thresholds of perception and pain.
Number of treatments: until pain is lessened, on a daily basis (even 2/3 times a day).

R09 Sprains/Bruises	Total program duration: 30 minutes
Position of electrodes: ankle (see photograph 32).	
Phase 1	Phase 2
Tens rapid 15 min.	Emathoma impulse 15 min.

R10 • Hand and wrist pain. (Medical program).
This program is suitable for all types of hand and wrist pain (for example Carpal Tunnel Syndrome). Intensity adjusted to a level between the thresholds of perception and pain: the maximum intensity level is the moment in which the muscles surrounding the area treated begin to contract. Intensity has to be adjusted 3 times, for each starting phase. Impulses at different frequencies stimulate different sized nerve fibres promoting an inhibitory action at spinal level.

R10 Hand and wrist pain	Total program duration: 40 minutes	
Phase 1	Phase 2	Phase 3
Tens 70Hz, 15 min	Tens 90Hz, 15 min	Tens 110Hz, 10 min

R11 • Plantar stimulation. (Not medical program)
This program has a relaxing and draining effect on the limb stimulated. It is ideal for people suffering from a sense of "heaviness in the legs".
Duration: 40 minutes. Intensity: set above the threshold of perception.
Position of electrodes: 2 electrodes (one positive, the other negative) on the sole of the foot, one close to the toes, the other under the heel.

R11 Plantar stimulation	Total program duration: 40 minutes	
Phase 1	Phase 2	Phase 3
Tens 70Hz, 15 min	Tens 2Hz, 15 min	Tens 90Hz, 10 min

R12 • Epicondylitis. (Medical Program).
Also known as "tennis elbow", it is an insertional tendinopathy concerning insertion of the elbow bone into the epicondylar muscles, those enabling finger and wrist extension (bending backwards). 15 applications once a day (even twice), until the symptoms pass. We recommend that you consult your doctor to identify the precise cause of the pain in order to prevent the condition from reoccurring.
Program duration 40 minutes, intensity adjusted above the threshold of perception.

R12 Epicondylitis	Total program duration: 40 minutes	
Position of electrodes: see photograph 29.		
Phase 1	Phase 2	Phase 3
Tens 90Hz, 20 min	Tens 70Hz, 10 min	Tens 50Hz, 10 min

R13 • Epitroclea. (Medical program).
Also known as "golfing elbow", it affects golfers but also those who carry out repetitive tasks or tasks involving frequent intense strain (for example carrying a particularly heavy suitcase). It causes pain in the flexor and pronator tendons inserted in the epitroclea. Pain is felt when bending or straightening the wrist against resistance, or when clenching a hard rubber ball in the hand. 15 applications once a day (even twice), until the symptoms pass. We recommend that you consult your doctor to identify the precise cause of the pain in order to prevent the condition from reoccurring.
Program duration 40 minutes, intensity adjusted above the threshold of perception.

R13 Epitroclea	Total program duration: 40 minutes
Position of electrodes: photograph 29 with electrodes moved towards the inside of the arm (rotated by 90°).	
Phase 1	Phase 2
Tens 90Hz, 20 min	Tens 70Hz, 20 min

R14 • Periarthritis. (Medical program).
Scapulo-humeral periarthritis is an inflammatory condition affecting the fibrous tissues surrounding joints: tendons, serous sacs and connective tissue. These appear altered and can break into fragments and calcify. If neglected, this condition can become heavily crippling. For this reason, after carrying out a cycle of 15/20 applications once a day, we recommend that you consult your doctor for a cycle of specific rehabilitation exercises to reduce the pain.
The R14 program consists of various phases including Tens and muscle stimulation aimed at improving the tone of the muscles surrounding the joint.
Program duration 41 minutes, intensity set above the threshold of perception with small muscle contractions at the end of the program (10 minutes before the end).

R14 Periarthritis	Total program duration: 41 minutes	
Position of electrodes: periarthritis (see photograph 26).		
Phase 1	Phase 2	Phase 3
Tens 150Hz, 1 min	Tens 90Hz, 30 min	EMS 10 min

R15 • Neuralgias. (Medical program)
Neuralgia Program, single-phase, 30 minutes of duration. Intensity adjusted just above the threshold of perception. Two treatments daily for 10/12 days.

R16 • Menstrual pains. (Medical program).

R16 Menstrual pains	Total program duration: 35 minutes
Position of electrodes: 2 electrodes of the channel 1 on lower abdomen.	
Phase 1	Phase 2
Tens 90Hz, 30 min	Tens Burst, 5 min

Intensity: adjusted in order to produce a light tingling, not painful.

R17 • Carpal tunnel. (Medical program).
Program duration: 30 minutes in a single phase. Position of electrodes: see photograph 33.
Intensity: adjusted in order to produce a light tingling, not painful.

R18 • Tendinitis. (Medical program).
Program duration: 20 minutes in a single phase. Position of electrodes: 2 electrodes of channel 1 on painful area.
Intensity: adjusted in order to produce a light tingling, not painful.

R19 • Strain. (Medical program).
Program duration: 20 minutes in a single phase. Position of electrodes: 2 electrodes of channel 1 on treated area.
Intensity: adjusted between 6 and 12. The maximum adjustable intensity is 12.

R20 • Muscular tears. (Medical program).
Program duration: 20 minutes in a single phase. Position of electrodes: 2 electrodes of channel 1 on treated area.
Intensity: adjusted between 6 and 12. The maximum adjustable intensity is 12.

R21 • Herpes Zoster. (Medical program).
Program duration: 30 minutes in a single phase. Position of electrodes: use channels 1 and 2 and form a square as shown in figure 1 page 12.
Intensity: adjusted in order to produce a light tingling, not painful.

R22 • Wounds/healing. (Medical program).
Position of electrodes: use the 2 electrodes of channel 1. Use rubber and buckskin electrodes or conductive rubber sponge-covered electrodes.
For repairing tissue, place sterile gauze dampened with a saline solution on the wound: the positive electrode is placed on the wound, and the negative electrode is placed distally or (if the treated zone is too thick) at 10 cm of distance. This causes migration of the vascular cells and the synthesis of collagen, increasing the speed of recovery. Total program duration: 15 minutes in a single phase. Intensity: should be adjusted to a level between the thresholds of perception and pain.

R23 • Wounds/bactericide. (Medical program).
Position of electrodes: use the 2 electrodes of channel 1. Use rubber and buckskin electrodes or conductive rubber sponge-covered electrodes.
Place a sterile gauze dampened with a saline solution on the wound to kill any bacteria. Cathode (positive electrode, red plug) is placed on the wound and negative electrode is placed distally or (if the treated zone is too thick) at a distance of 10 cm. This provokes a bactericide effect and consequently the growth of pathogenic microorganisms is delayed.
Total program duration: 15 minutes in a single phase. Intensity: should be adjusted to a level between the thresholds of perception and pain.

R24 • Venous insufficiency. (Medical program).
The program is indicated for the treatment of venous insufficiency. Position the 2 electrodes of channel 1 on the left calf and the 2 electrodes of channel 2 on the right calf. It is possible to use square or rectangular electrodes according to the size of the calf and the comfort of the patient. Start the program by selecting an intensity able to produce a good (not painful) muscular contraction.

Program duration: 60 minutes in a single phase.

R25 • Superficial osteogenesis. (Medical program).
A study of the healing of fractures was carried out in 1968 in Japan and the United States. This study consists of two main techniques:

1. The implanting of sharp needle electrodes near the bone to be calcified (invasive technique).
2. The positioning of self-adhesive electrodes on the external surface near the bone.

We consider the second technique for the treatment of fractures, in particular when the bone to be stimulated is in a superficial position (vertebral column, wrist, kneecap, ankle, etc.). This technique is not suitable if the bone is in a deep position (femur, humerus, radius, etc.).
2 electrodes of channel 1 have to be positioned 10 cm apart near the bone to be treated.
The program lasts 60 minutes and it can be repeated several times a day (up to 4/5 times).
The maximum adjustable intensity is 30.
For the treatment of the vertebral column use 2 rectangular electrodes measuring 50x90mm. To treat smaller zones (for example the wrist), use electrodes measuring 48x48mm.

Table of current density with electrodes measuring 48x48mm:

Value displayed on screen	Current density mA/cm²	Current density µA/cm²
5	0.034	34
10*	0.068	68
20	0.137	137
30	0.205	205

Table of current density with electrodes measuring 50x90mm:

Value displayed on screen	Current density mA/cm²	Current density µA/cm²
5	0.0175	17.5
10*	0.035	35
20*	0.07	70
30	0.105	105

* The recommended intensity ranges are in bold.

EMS programs.

IMPORTANT. Intensity of stimulation: EMS programs (Firming up and Toning up, Strength, Endurance, Agonist/Antagonist) are divided in 3 phases: warm up phase, work phase, recovery phase. During the warm up phase (phase 1) the intensity of stimulation has to be set in order to produce reasonable solicitation of the muscle and warm it up without causing fatigue (18÷30mA). During the work phases (the middle phases of each program), T-ONE alternates contraction impulses with active recovery impulses. The two intensities must be selected separately: the contraction intensity (shown by a full bar on the display) should be set at 20÷30 for not very trained people, 30÷50mA for trained people, over 50mA for well trained people.
We suggest that you set the recovery intensity value (between one contraction and another) at about 10÷15% less than the contraction intensity value. During the last recovery phase, the intensity value has to be set for good massaging of the stimulated part, without producing pain (18÷30).

E01 • Firming up.
Indicated for firming up muscles in the arms and bust, or the legs; working mainly on slow-twitch fibres. Treatment frequency: 3/4 times in a week.
The intensity must be sufficient to produce good but not painful muscle contractions (15 as an initial value) increasing it gradually week by week.

Programs and muscle groups of interest with electrodes position photograph as reference:

E01 Firming up	Total program duration: 30 minutes	
	Biceps (photograph 02/15), Triceps (photograph 03/16), Hand Extensors (photograph 04), Hand Flexors (photograph 05), Deltoid (photograph 06).	
	Abdominals (photograph 01/20), Pectoral/Breast (photograph 07/17), Trapezius (photograph 08), Large dorsal (photograph 09), Gluteus (photograph 19).	
	Quadriceps/thighs (photograph 11/18), Biceps femoris (photograph 12), Calves (photograph 13), Anterior tibial (photograph 14).	
Phase 1	Phase 2	Phase 3
5 min. Warm up	20 min. Training 13 sec. recovery 7 sec. Work 30Hz	5 min. Recovery

E02 • Toning up.
The toning up program is suitable for improving trophsim and for the recovery of normal strength in the treated muscle. This program is indicated after a complete cycle of a minimum of 10 treatments with the "E01 Firming up" program.
Treatment frequency: 2/3 weekly sessions.
Stimulation intensity has to be middle/high with a contraction between the thresholds of perception and pain (20÷30). Benefits can be seen after just 10/15 treatments and these become more definite after two months of regular treatment.

Programs and muscle groups of interest with photographs showing the position of the electrodes:

E02 Toning up	Total program duration: 30 minutes	
	Biceps (photograph 02/15), Triceps (photograph 03/16), Hand Extensors (photograph 04), Hand Flexors (photograph 05), Deltoid (photograph 06).	
	Abdominals (photograph 01/20), Pectoral/Breast (photograph 07/17), Trapezius (photograph 08), Large dorsal (photograph 09), Gluteus (photograph 19).	
	Quadriceps/thighs (photograph 11/18), Biceps femoris (photograph 12), Calves (photograph 13), Anterior tibial (photograph).	
Phase 1	Phase 2	Phase 3
5 min. Warm up	20 min. Training 13 sec. recovery 7 sec. Work 45Hz	5 min. Recovery

E03 • Basic strength.
The basic strength program is used in sport to develop basic strength which, by definition, is the maximum tension that a muscle can exert against constant resistance. The contractions alternate with periods of active recovery during the work phase, allowing the muscle to be trained without subjecting it to stress and improving oxygenation of the same muscle.
The basic rule for obtaining initial results is as follows: two sessions per week (for each muscle region) for the first three weeks at increasing intensity (20÷30), three sessions per week for the next three weeks at high intensity (30÷50).

Intensity must be increased gradually treatment by treatment, without overstraining the muscles. In the event of fatigue, suspend training for a few days and revert to the "E09 Muscle Recovery" program instead.
WARNING: the program involves an automatic increase in intensity between the second and the third phase. Consequently it will not be necessary to adjust stimulation intensity between phases but only press the Up arrow key for any one of the 4 channels. The first work/recovery cycle of phase 3 will start at an intensity of 90% of that set for phase 2; the second work/recovery cycle will go up to 95% of intensity and finally the third work/recovery cycle will go up to 100% of the intensity set for phase 2.

Programs and muscle groups of interest with electrodes position photographs as reference:

E03 Basic strength	Total program duration: 30 minutes			
	Biceps (photograph 02/15), Triceps (photograph 03/16), Hand Extensors (photograph 04), Hand Flexors (photograph 05), Deltoid (photograph 06).			
	Abdominals (photograph 01/20), Pectoral/Breast (photograph 07/17), Trapezius (photograph 08), Large dorsal (photograph 09), Gluteus (photograph 19).			
	Quadriceps/thighs (photograph 11/18), Biceps femoris (photograph 12), Calves (photograph 13), Anterior tibial (photograph 14).			
Phase 1	Phase 2	Intensity Automatic Increase	Phase 3	Phase 4
5 min. Warm up	10 min. Training 13 sec. recovery 7 sec. Work 50Hz		10 min. Training 14 sec. recovery 6 sec. Work 70Hz	5 min. Recovery

E04 • Fast Strength.
This program is designed to increase speed in fast athletes and develop it in athletes lacking the quality.
The exercise assumes a fast pace and the contraction is short, as is the recovery. It is usually best to complete a three-week basic strength cycle of increasing intensity before using this program. Then continue with three weeks of fast strength three times a week at high intensity (30÷50).
WARNING: the program involves an automatic increase in intensity between the second and the third phase. Consequently it will not be necessary to adjust stimulation intensity between phases but only press the Up arrow key for any one of the 4 channels. The first work/recovery cycle of phase 3 will start at an intensity of 90% of that set for phase 2; the second work/recovery cycle will go up to 95% of intensity and finally the third work/recovery cycle will go up to 100% of the intensity set for phase 2.

Programs and muscle groups of interest with photographs showing the position of the electrodes:

E04 Fast Strength				Total program duration: 26 minutes
	Biceps (photograph 02/15), Triceps (photograph 03/16), Hand Extensors (photograph 04), Hand Flexors (photograph 05), Deltoid (photograph 06).			
	Abdominals (photograph 01/20), Pectoral/Breast (photograph 07/17), Trapezius (photograph 08), Large dorsal (photograph 09), Gluteus (photograph 19).			
	Quadriceps/thighs (photograph 11/18), Biceps femoris (photograph 12), Calves (photograph 13), Anterior tibial (photograph 14).			
Phase 1	Phase 2	Intensity Automatic Increase	Phase 3	Phase 4
3 min. Warm up	10 min. Training 14 sec. recovery 6 sec. work		8 min. Training 10 sec. recovery 5 sec. work	5 min. Recovery

E05 • Explosive Strength.

Explosive strength programs increase the explosive power and speed of the muscle mass, with extremely short, strengthening contractions and very long active recovery times to allow the muscle to regain strength. It is usually best to complete a three-week basic strength cycle of increasing intensity before using this program. Then continue with three weeks of explosive strength twice a week. During the contraction, the intensity must be the highest that can be endured in order to obtain maximum muscle exertion whilst involving the greatest number of fibres (over 35).

WARNING: the program involves an automatic increase in intensity between the second and the third phase. Consequently it will not be necessary to adjust stimulation intensity between phases but only press the Up arrow key for any one of the 4 channels. The first work/recovery cycle of phase 3 will start at an intensity of 90% of that set for phase 2; the second work/recovery cycle will go up to 95% of intensity and finally the third work/recovery cycle will go up to 100% of the intensity set for phase 2.

Programs and muscle groups of interest with electrodes position photographs as reference:

E05 Explosive Strength				Total program duration: 28 minutes
	Biceps (photograph 02/15), Triceps (photograph 03/16), Hand Extensors (photograph 04), Hand Flexors (photograph 05), Deltoid (photograph 06).			
	Abdominals (photograph 01/20), Pectoral/Breast (photograph 07/17), Trapezius (photograph 08), Large dorsal (photograph 09), Gluteus (photograph 19).			
	Quadriceps/thighs (photograph 11/18), Biceps femoris (photograph 12), Calves (photograph 13), Anterior tibial (photograph 14).			
Phase 1	Phase 2	Intensity Automatic Increase	Phase 3	Phase 4
3 min. Warm up	10 min. Training 24 sec. recovery 6 sec. work		10 min. Training 24 sec. recovery 6 sec. work	5 min. Recovery

E06 • Resistant Strength.

This program is designed to help increase resistance to physical stress, or rather withstand intense exertion for a longer amount of time in muscle regions subjected to stimulation. Indicated for sporting disciplines involving long, intense periods of exertion.

Intensity of stimulation during work: follow the indications mentioned at the beginning of the "EMS Program" chapter.

WARNING: the program involves an automatic increase in intensity between the second and the third phase. Consequently it will not be necessary to adjust stimulation intensity between phases but only press the Up arrow key for any one of the 4 channels. The first work/recovery cycle of phase 3 will start at an intensity of 90% of that set for phase 2; the second work/recovery cycle will go up to 95% of intensity and finally the third work/recovery cycle will go up to 100% of the intensity set for phase 2.

Programs and muscle groups of interest with electrodes position photographs as reference:

E06 Resistant Strength				Total program duration: 30 minutes
	Biceps (photograph 02/15), Triceps (photograph 03/16), Hand Extensors (photograph 04), Hand Flexors (photograph 05), Deltoid (photograph 06).			
	Abdominals (photograph 01/20), Pectoral/Breast (photograph 07/17), Trapezius (photograph 08), Large dorsal (photograph 09), Gluteus (photograph 19).			
	Quadriceps/thighs (photograph 11/18), Biceps femoris (photograph 12), Calves (photograph 13), Anterior tibial (photograph 14).			
Phase 1	Phase 2	Intensity Automatic Increase	Phase 3	Phase 4
5 min. Warm up	10 min. Training 20 sec. recovery 10 sec. work		10 min. Training 20 sec. recovery 10 sec. work	5 min. Recovery

E07 • Endurance.

The Endurance program is used in sports to increase muscle endurance capacity, acting mainly on slow-twitch fibres.

Program indicated for endurance sports: marathon runners, cross-country runners, ironman, etc.

Intensity of stimulation during work: follow the indications mentioned at the beginning of the "EMS Program" chapter.

WARNING: the program involves an automatic increase in intensity between the second and the third phase. Consequently it will not be necessary to adjust stimulation intensity between phases but only press the Up arrow key for any one of the 4 channels. The first work/recovery cycle of phase 3 will start at an intensity of 90% of that set for phase 2; the second work/recovery cycle will go up to 95% of intensity and finally the third work/recovery cycle will go up to 100% of the intensity set for phase 2.

E07 Endurance	Total program duration: 50 minutes
	Biceps (photograph 02/15), Triceps (photograph 03/16), Hand Extensors (photograph 04), Hand Flexors (photograph 05), Deltoid (photograph 06).
	Abdominals (photograph 01/20), Pectoral/Breast (photograph 07/17), Trapezius (photograph 08), Large dorsal (photograph 09), Gluteus (photograph 19).
	Quadriceps/thighs (photograph 11/18), Biceps femoris (photograph 12), Calves (photograph 13), Anterior tibial (photograph 14).

Phase 1	Phase 2		Phase 3	Phase 4
5 min. Warm up	20 min. Training 20 sec. recovery 10 sec. work	Intensity Automatic Increase	10 min. Training 22 sec. recovery 8 sec. work	5 min. Recovery

E08 • Capillarisation.
This program significantly increases arterial flow in the area treated. Prolonged use of this program develops the intramuscular capillary network of fast-twitch fibres. The effect obtained is an increase in the capacity of fast-twitch fibres to withstand strain over extended periods of time.
For an athlete with good endurance, the capillarisation program is very useful for recovery after intense aerobic work, before anaerobic work and when training is not possible (due to bad weather or an injury). Program duration: 30 minutes / one phase. Recommended intensity of stimulation: medium (20÷30).
Position of electrodes: see photographs 01 to 20.

E09 • Muscle Recovery.
Can be used for all sports, after competitions or the most demanding training sessions, in particular after long and intense exertion. To be used immediately after exertion. Helps drainage and winding down, improving muscle oxygenation and helping to discharge synthetic substances produced during exertion. Program duration: 15 minutes / one phase. Intensity of stimulation: medium-low (15÷25), increased during the last 5 minutes.
Position of electrodes: see photographs 01 to 20.

E10 • Agonist / Antagonist.
The electric stimulator produces alternating contractions on the 4 channels: during the first phase of warm-up the 4 channels work simultaneously, during the second work phase muscle contractions are alternated between Channel 1 and 2 (agonist muscles) and Channel 3 and 4 (antagonist muscles). The program is designed to restore muscle tone to the quadriceps and its antagonist the leg biceps, or the biceps brachii and the triceps. The work aims at developing strength.
In the second work phase it is necessary to select the intensity 3 times: recovery intensity of four channels, work intensity of Channels 1 and 2 (agonist muscles) and work intensity of Channels 3 and 4 (antagonist muscles).
Intensity of stimulation during work: follow the indications mentioned at the beginning of the "EMS Program" chapter. Intensity must be increased gradually treatment by treatment, without overstraining the muscles. Suspend training for a few days in the event of fatigue and proceed with the "E09 Muscle Recovery" program.

E10 Agonist / Antagonist	Total program duration: 33 minutes	
	Biceps (CH1+CH2 - photograph 02) / Triceps (CH3+CH4 – photograph 03), Hand Extensors (CH1+CH2 – photograph 04) / Hand Flexors (CH3+CH4 - photograph 05).	
	Quadriceps (CH1+CH2 – photograph 11) / Femoral biceps (CH3+CH4 - photograph 12).	
Phase 1	Phase 2	Phase 3
3 min. Warm up	20 min. work alternated over channel pairs: 6 sec. recovery 7sec. work on CH1/CH2 + 7sec. work on CH3/CH4	10 min. Recovery

E11 • Lipolysis.

This program is widely used in the field of beauty treatments to increase micro-circulation and promote lymphatic activity in areas where there are fatty deposits. This program greatly increases the local metabolism thanks to its trophic action; it helps to reduce the orange-peel effect when combined with a low-calorie diet. Treatment sessions can have a daily frequency.

The program produces sequential tonic contractions (first CH1/CH2 then CH3/CH4), reproducing the typical effect of electronic lymphatic drainage. The logic for application of the electrodes is the following: CH1/CH2 at the extremities of the limbs (for example the calf or forearm) and CH3/CH4 at the top (for example the thigh or biceps brachii).

Intensity of stimulation: to produce good (not painful) effects in the stimulated areas (20÷30).

E11 Lipolysis	Total program duration: 30 minutes	
Lower Muscles:	Hands Extensors CH1 (photograph 04 with 2 electrodes) / Hands Flexors CH2 (photograph 05 with 2 electrodes); Biceps brachii CH3 (photograph 02 with 2 electrodes) / Triceps CH4 (photograph 03 with 2 electrodes)	
Lower Muscles:	Calves CH1 (photograph 13 with 2 electrodes) / Anterior tibial muscles CH2 (photograph 14 with 2 electrodes); Quadriceps CH3 (photograph 11 with 2 electrodes) / Femoral biceps CH4 (photograph 12 with 2 electrodes)	
Phase 1	Phase 2	Phase 3
5 min. Warm up	20 min. work alternated over channel pairs: 6 sec. recovery 7sec. work on CH1/CH2 7sec. work on CH3/CH4	5 min. Recovery

E12 • Drainage.

The purpose of these programs is to promote drainage, increasing microcirculation inside and around treated muscular fibres, also creating rhythmic contractions to facilitate the flow of algogenic substances and lymphatic activity. This program can be useful for elderly people, to aid blood circulation and lymphatic circulation.

Sequential tonic contractions are carried out during phases 2 and 3 to produce the typical effect of electronic lymphatic drainage. However, unlike the lipolysis program, the contractions are sequential: first CH1, then CH2, CH3 and CH4.

There are no real limits to the use of these programs, so they can continue to be used until the desired result is achieved.

The intensity of stimulation must be such to assure good muscular contractions during treatment, but not so strong as to generate soreness (20÷30).

Normally, benefits are discernible after 3/4 weeks with 4/5 treatments a week.

Program and muscle groups of interest with photographs showing the position of the electrodes:

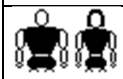
E12 Drainage	Total program duration: 25 minutes
Lower Muscles:	all the muscles you want to stimulate in sequence. Connect one channel per muscle, bearing in mind that the contractions are sequential on 4 channels.

Phase 1	Phase 2	Phase 3
3 min. Warm up	20 min. sequential contractions on 4 channels	2 min. Recovery

E13 • Microlifting.
The following program, with a duration of 15 minutes, is used to tone facial muscles using a special impulse to improve both the appearance and the dynamism of facial muscles.
The position of the electrodes is shown in the photographs of electrode positions (photograph 24).

N.B. a minimum distance of 3cm. must be kept between the electrode and the eyeball.
IMPORTANT: take care when adjusting the intensity as facial muscles are particularly sensitive; intensity should be increased gradually, starting with a very low level of stimulation (for example 3÷10) and increasing it with extreme care until you reach a good level of stimulation, represented by good muscle activation.
IMPORTANT: it is not necessary to reach levels of intensity capable of causing discomfort! The equation "more pain = more gain" is completely misleading and counterproductive.
Great and significant results are obtained through consistency and patience.

E14 • Atrophy prevention. (Medical program).
Program created to maintain muscle trophism.
This treatment focuses on the toning of muscles, and of slow-twitch fibres in particular. Particularly indicated for patients recovering from an accident or an operation. Prevents the reduction of muscle trophism caused by physical inactivity. The muscle area concerned can be stimulated with daily applications of low intensity; if you increase the intensity, leave a day of rest between applications to allow the muscles to recover.
WARNING: the program involves an automatic increase in intensity between the second and the third phase. Consequently it will not be necessary to adjust stimulation intensity between phases but only press the Up arrow key for any one of the 4 channels. The first work/recovery cycle of phase 3 will start at an intensity of 90% of that set for phase 2; the second work/recovery cycle will go up to 95% of intensity and finally the third work/recovery cycle will go up to 100% of the intensity set for phase 2.
Programs and muscle groups of interest with photographs showing the position of the electrodes:

E14 Prevention of atrophy	Total program duration: 30 minutes
	Biceps (photograph 02/15),Triceps (photograph 03/16), Hands Extensors (photograph 04), Hands Flexors (photograph 05), Deltoid (photograph 06).
	Abdominals (photograph 01/20), Pectoral/Breast (photograph 07/17), Trapezius (photograph 08), Large dorsal (photograph 09), Gluteus (photograph 19), Abdomen Obliques (photograph 22), Hip (photograph 23).
	Quadriceps/thighs (photograph 11/18), Femoral biceps (photograph 12), Calves (photograph 13), Anterior tibial muscles (photograph 14).

Phase 1	Phase 2		Phase 3	Phase 4
5 min. Warm up	10 min. 9 sec. recovery 6 sec. work	Intensity Automatic Increase	10 min. 9 sec. recovery 6 sec. work	5 min. Recovery

E15 • Atrophy. (Medical program).
This program acts selectively on slow-twitch fibres. Ideal for recovering muscle trophism after a long period of inactivity or an accident.
Program to be carried out when loss of muscle tone has already occurred. Apply with caution (at low intensity, enough to produce light muscle contractions) in the first 2/3 weeks. Increase intensity progressively over the next 3/4 weeks. Application on alternate days.

Programs and muscle groups of interest with photographs showing the position of the electrodes:

E15 Atrophy	Total program duration: 30 minutes	
	Biceps (photograph 02/15),Triceps (photograph 03/16), Hands Extensors (photograph 04), Hands Flexors (photograph 05), Deltoid (photograph 06).	
	Abdominals (photograph 01/20), Pectoral/Breast (photograph 07/17), Trapezius (photograph 08), Large dorsal (photograph 09), Gluteus (photograph 19), Abdomen Obliques (photograph 22), Hip (photograph 23).	
	Quadriceps/thighs (photograph 11/18), Femoral biceps (photograph 12), Calves (photograph 13), Anterior tibial muscles (photograph 14).	
Phase 1	Phase 2	Phase 3
3 min. Warm up	25 min: 6 sec. recovery + 6 sec. work	2 min. Recovery

E16 • Sequential tonic contractions 1.
This program increases microcirculation within and around the muscle fibres treated creating rhythmic contractions, promoting better drainage and toning. It can also be applied to older people to improve blood and lymphatic circulation in the lower limbs (e.g. applying CH1 to the right calf, CH2 to the left calf, CH3 to the right thigh, CH4 to the left thigh).
The programs produce sequential tonic contractions on 4 channels to produce the typical effect of electronic lymphatic drainage. These programs can be carried out using self-adhesive electrodes. The intensity of stimulation must be such to assure good muscular contractions during treatment, but not so strong as to generate soreness (20÷25). It mainly works on slow-twitch fibres.

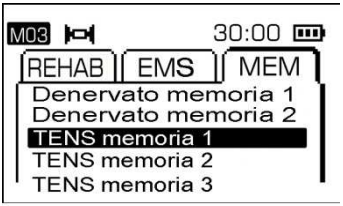
E16 Sequential tonic contractions 1	Total program duration: 25 minutes	
Lower Muscles:	all you want to stimulate in a sequence	
Phase 1	Phase 2	Phase 4
3 min. Warm up	20 min. sequential contractions on 4 channels 6 sec duration each	2 min. Recovery

E17 • Sequential tonic contractions 2.
This program produces rhythmic contractions with a stimulation frequency typical of fast-twitch fibres. Thanks to the high stimulation frequency it is suitable for increasing muscle strength sequentially.
The programs produce sequential phasic contractions on four channels in phase 2 and 3. These programs can be carried out using self-adhesive electrodes. The intensity of stimulation must be such to assure good muscular contractions during treatment, but not so strong as to generate soreness (20÷40).

Unlike the previous program, this one uses a higher stimulation frequency during the contraction phase and therefore works mainly on fast-twitch fibres.

E17 Sequential tonic contractions 2		Total program duration: 25 minutes
Lower Muscles: all you want to stimulate in a sequence		
Phase 1	Phase 2	Phase 3
3 min. Warm up	20 min. sequential contractions on 4 channels 6 sec duration each	. 2 min. Recovery

Programmable memories.



M01/M02 • Denervated 1/2. (Medical program).
Stimulation programs for denervated muscle. Active channels: CH1.
Position of electrodes: use 2 big electrodes, better if wet and in a sponge, placed at the two ends of the muscle to be treated.
Use the left and right arrow keys to scroll through the menu and select the stimulation parameter, and use the up and down keys to modify the values.

After setting all the stimulation parameters, click on OK to save the program.

To start the saved program, press the OK key.

Three sound signals alert to the end of the program.

In the case of impulses longer than 100ms, set the maximum intensity at 1 Hz.

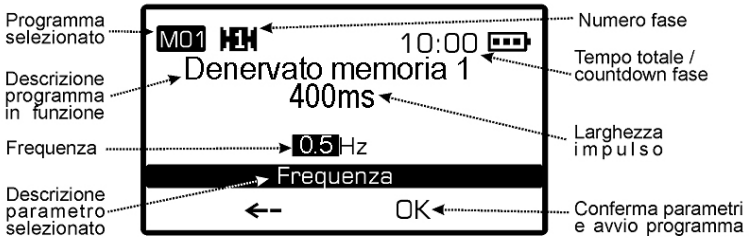


Table of settable values:

PARAMETER DESCRIPTION	MIN	MAX
Frequency	0.25 Hertz	2 Hertz
Impulse width	40 milliseconds	400 milliseconds
Total time	1 minute	60 minutes

WARNING: In the case of programs M01 and M02, we recommend the use of rectangular electrodes (measuring 50x90 mm) for stimulation at medium-high intensity. With smaller electrodes, the device could generate an alarm and, therefore, not perform the treatment correctly.

M03/M04/M05/M06 • TENS memory 3/4/5/6. (Medical program).
Available programs to set rapid tens, endorphinic tens, maximum values.
Position of electrodes: form a square above the area to be treated as shown in figure 1.

Use the left and right arrow keys to scroll through the menu and select the stimulation parameter, and use the up and down keys to modify the values.

After setting all the stimulation parameters, click on OK to save the program.

To start the saved program, press the OK key.

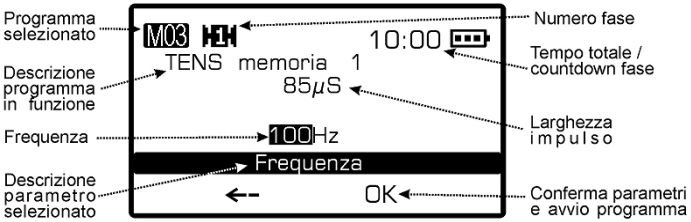


Table of settable values:

PARAMETER DESCRIPTION	MIN	MAX
Frequency	0.25 Hertz	120 Hertz
Impulse width	20 microseconds	500 microseconds
Total time	1 minute	60 minutes

M07 • TENS Spyke. (Medical program).
Available programs to set Tens Spyke.
Position of electrodes: form a square above the area to be treated as shown in figure 1.
Use the left and right arrow keys to scroll through the menu and select the stimulation parameter, and use the up and down keys to modify the values.

After setting all the stimulation parameters, click on OK to save the program.

To start the saved program, press the OK key.

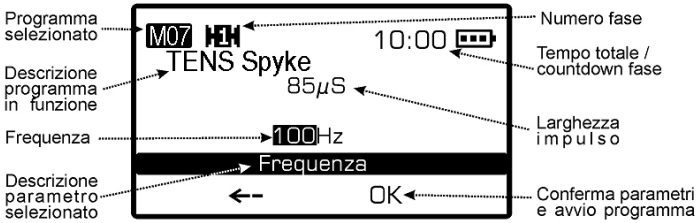


Table of settable values:

PARAMETER DESCRIPTION	MIN	MAX
Frequency	0.25 Hertz	120 Hertz
Impulse width	20 microseconds	500 microseconds
Total time	1 minute	60 minutes

M08/M09 • EMS 1 second slope.
EMS 1 sec. slope: to set the EMS program with a 1 second impulse slope.

IMPORTANT: 1 second slopes make for a faster contraction, while 2/3 second slopes make for a more progressive contraction. In the case of memories 12 and 13 in particular, a 3 second slope can be used to obtain a "triangular" impulse where the impulse parameters are continuously adjusted. This program is specifically indicated for the treatment of partially denervated muscles.

After setting all the stimulation parameters, click on OK to save the program.

To start the saved program, press the OK key.

Three sound signals alert to the end of the program.

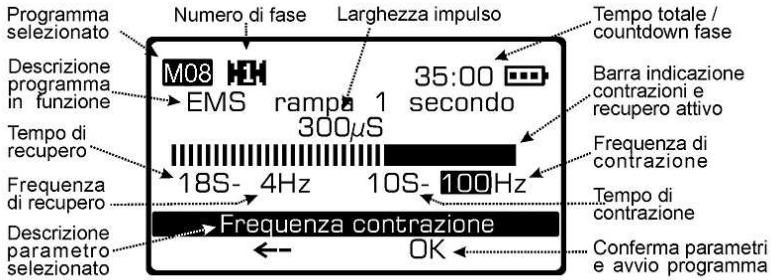


Table of settable values:

PARAMETER DESCRIPTION	MIN	MAX
Contraction frequency	20 Hertz	120 Hertz
Contraction time	2 seconds	10 seconds
Recovery frequency	0 Hertz	12 Hertz
Recovery time	2 seconds	28 seconds
Impulse width	60 microseconds	500 microseconds
Total time	1 minute	60 minutes

M10/M11 • EMS 2 second slope.
EMS 2 sec. slope: to set the EMS program with a 2 second impulse slope.

Table of settable values:

PARAMETER DESCRIPTION	MIN	MAX
Contraction frequency	20 Hertz	120 Hertz
Contraction time	4 seconds	10 seconds
Recovery frequency	0 Hertz	12 Hertz
Recovery time	2 seconds	26 seconds
Impulse width	60 microseconds	500 microseconds
Total time	1 minute	60 minutes

M12/M13 • EMS 3 second slope.
EMS 3 sec. slope: to set the EMS program with a 3 second impulse slope.

Table of settable values:

PARAMETER DESCRIPTION	MIN	MAX
Contraction frequency	20 Hertz	120 Hertz
Contraction time	6 seconds	10 seconds
Recovery frequency	0 Hertz	12 Hertz
Recovery time	2 seconds	24 seconds
Impulse width	60 microseconds	500 microseconds
Total time	1 minute	60 minutes

M14/M15 • FES.
Available programs to set treatments for incontinence prevention and cure.

Table of settable values:

PARAMETER DESCRIPTION	MIN	MAX
Contraction frequency	20 Hertz	120 Hertz
Contraction time	6 seconds	10 seconds
Recovery frequency	0 Hertz	12 Hertz
Recovery time	2 seconds	24 seconds
Impulse width	60 microseconds	500 microseconds
Total time	1 minute	60 minutes

M16/M17/M18 • Agonist/antagonist 16/17/18.
Available programs to set treatments with alternated contractions on a pair of channels.
Position of electrodes: see the photographs in the position manual.
Use the left and right arrow keys to scroll through the menu and select the stimulation parameter, and use the up and down keys to modify the values.

After setting all the stimulation parameters, click on OK to save the program.

To start the saved program, press the OK key.

Three sound signals alert to the end of the program.

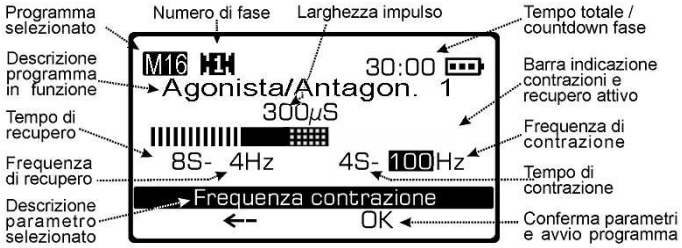


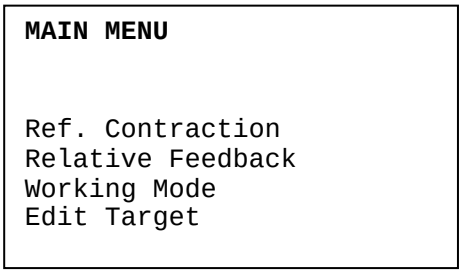
Table of settable values:

PARAMETER DESCRIPTION	MIN	MAX
Contraction frequency	20 Hertz	120 Hertz
Contraction time	2 seconds	10 seconds
Recovery frequency	0 Hertz	12 Hertz
Recovery time	2 seconds	26 seconds
Impulse width	60 microseconds	500 microseconds
Total time	1 minute	60 minutes

Instructions on use for electromyography (EMG) treatments

The I-TECH PHYSIO EMG has a biofeedback module based on the analysis of surface electromyographic (EMG) signals. It was designed to evaluate and record the electrical activity produced by the human body and provide feedback via two channels.
Bipolar electrodes process the bioelectrical signals. These signals are amplified, filtered, converted into digital format and displayed on the screen (and saved in the memory when applicable).
The biofeedback is both visual (on the screen) and audible (with an internal buzzer).
The I-TECH PHYSIO EMG allows the user to record different levels of maximum voluntary contraction of the two muscles and to set different feedback thresholds for each muscle.

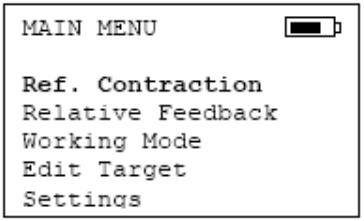
To access the functions of the EMG module, simply click on the EMG icon in the main menu of the I-TECH PHYSIO EMG: the main menu then appears as shown in the figure.

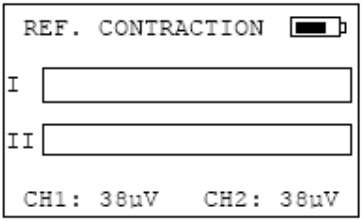


The work menu of the 4/EMG module is as follows:

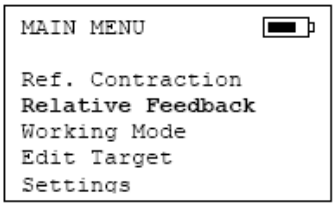
Mode		Description
Reference Contraction		Records the level of reference contraction for calibrating the measurements in the relative mode
Relative Feedback		Enables audible and visual feedback. The level of muscle activation is recorded in relation to the reference contraction
Working Mode	Under Threshold	This mode prevents exceeding a set threshold for each muscle
	Keep Level	This mode is for maintaining a level of contraction expressed as a percentage of the reference contraction
Edit Target		Permits setting the level of contraction to be maintained for Keep Level mode
Settings	Channel Settings	Permits enabling or disabling the channels and setting the visualisation scale and the alarm threshold
	Save/Load Settings	Saves or loads the settings for the device in one of the 4 available locations in the memory
	Epoch Size	Sets the epoch for calculating the width of the received signal (0.25 – 0.5 – 1 s)
	Filename ID	Permits editing of the identification code to create the names of files containing the data
	Target Error	Permits editing of the tolerance to attain the level of contraction set in Keep Level mode
	Reset Counters	Resets the counters used to number the files containing the data

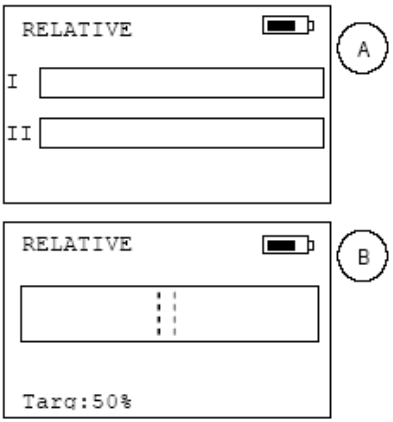
To the right in the figure below is the screen that appears when the user selects the mode for recording the maximum voluntary contraction (MVC).



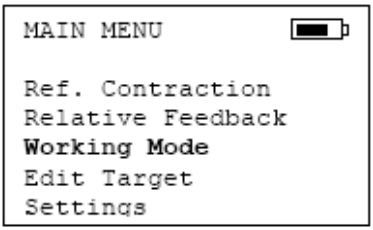


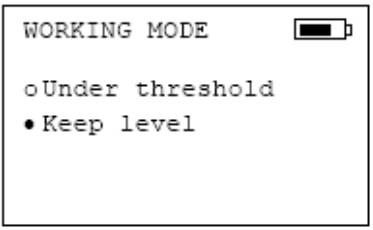
To the right in the figure below are the two screens that appear when the user selects the Under Threshold feedback mode (A) instead of Keep Level mode (B).





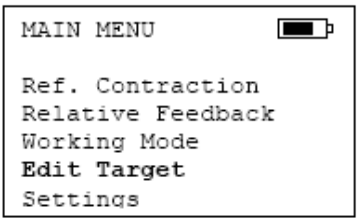
To the right in the figure below is the screen that appears when the user wishes to select the working mode.

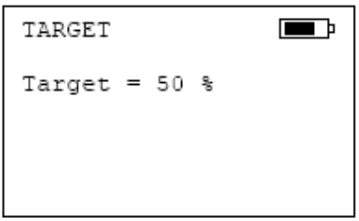


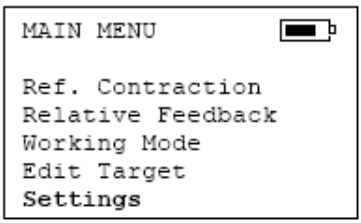


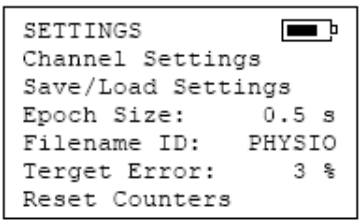
To the right in the figure below is the screen that appears when the user wishes to select the Target.

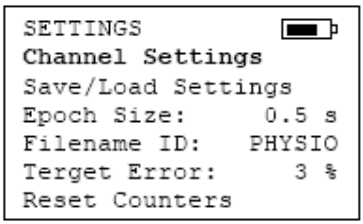
The 4 figures below show all the screens that appear in the Setting mode.

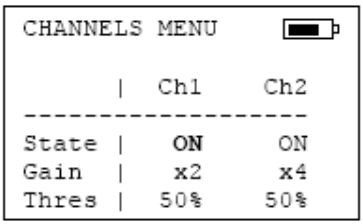






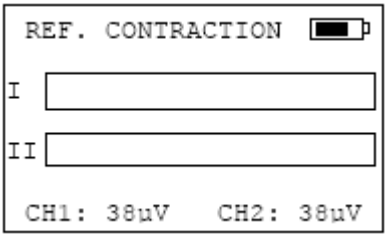






Reference Contraction Mode

This functions permits recording of the reference contraction for each channel (each channel is associated with one pair of electrodes).



In this mode, the instrument provides visual biofeedback in the form of the width of the electromyographical signal standardised at the maximum acceptable value. The PHYSIO 4/EMG system automatically records the maximum signal for each of the active channels.

Press "ESC" to exit Reference Contraction mode and return to the main menu; the Up and Down arrows keys are not used in this mode.

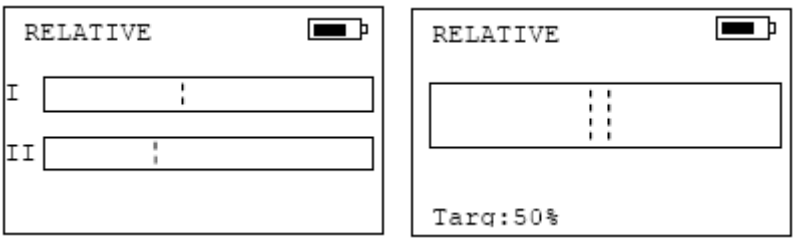
Re-entering Reference contraction mode resets the data ready for reassessment.

In this mode, press OK once to record the course of the signal (when applicable), i.e. the average rectified values (ARVs) of the current contraction. To close the file, press the OK key again.

Relative Feedback Mode

This functions permits recording of the reference contraction for each channel (each channel is associated with one pair of electrodes).

In this mode, visual and audible feedback is provided for the patient as a percentage of the reference contraction for the various channels, which must have been previously recorded for each channel. The screens differ according to the selected type of mode (Working Mode) selected (Keep Level or Under Threshold).



The Under Threshold mode is shown in the figure to the left. The system shows 2 dotted vertical bars that indicate the threshold set for each channel. A horizontal bar increases or decreases its width in

proportion to the level of contraction and keeps within a maximum range relating to the intensity of the reference contraction.

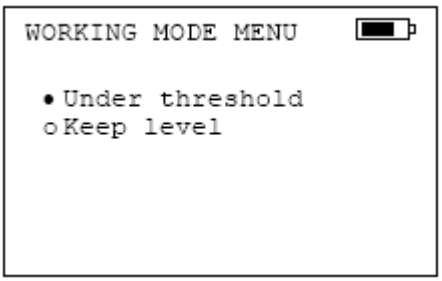
The Keep Level mode is shown to the right. The two dotted vertical lines indicate the maximum and minimum strength values within which the user must remain to maintain the level.

The distance between the dotted vertical lines corresponds to the degree of precision required to maintain the required level. This precision can be modified in the Advanced Settings menu following the instructions provided further on.

The Target value set in the Keep Level section is calculated as the average of the width of the active channels. The contraction level, i.e. the ARVs, can be recorded when applicable. Use the Up and Down arrow keys to edit the value of the target and, therefore, the position of the dotted vertical bars. In both Relative Feedback modes, press OK to start recording the signals of each active channel and then press it again to stop recording. The format of the recorded files is described in the next section of this manual.

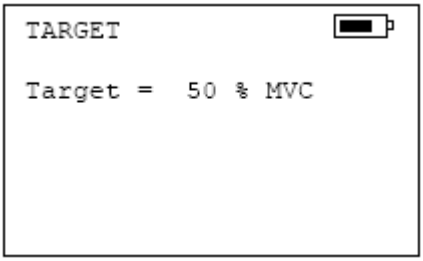
Working Mode Function

Use the Up and Down arrow keys in the main window to enter the sub-menu for selecting the relative working mode of the instrument and setting the required function. Press OK to save the selected function and use the Left arrow key to return to the previous screen.



Working Mode Function

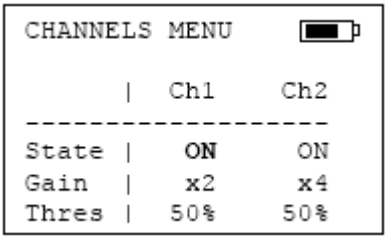
This parameter is for adjusting the level of deviation from the set maximum and minimum thresholds of the PHYSIO EMG for the Relative Feedback → Keep Level mode. The target can be set at a value between 0 and 98% in steps of 2%. Use the Up and Down arrow keys to edit the target deviation value. Press OK to save the new value and automatically return to the previous screen, and use the Left arrow key to return to the previous screen without saving the changes.



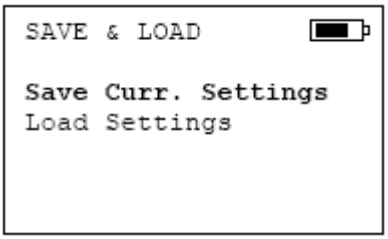
Settings

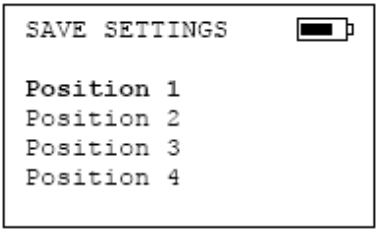
This menu enables the user to edit the instrument's settings.

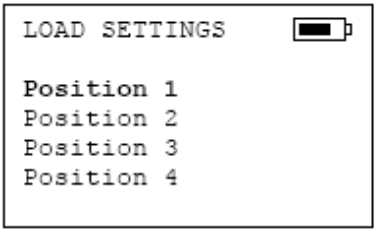
Channel Settings This function permits modification of the settings of each channel. Use the arrow keys to select a parameter and press OK to then scroll through the possible values and edit the parameter. It is possible to change the status of each channel (ON or OFF), change the gain (x1, x2, x4 and x8) and change the threshold for Under Threshold mode in steps of 2%.



Save/LoadSettings. This function is for saving new parameters or loading ones already saved.







EpochSize. This parameter is used to calculate ARVs. The basic EMG signal is rectified and average over time intervals called epochs. The values can be 0.25 s, 0.5 s and 1 s. Increasing the duration of the epoch increases the stability of the ARVs and also of the feedback signal, but decreases the speed of response.

Filename ID. the string represents a part of the name of the saved file to which is added a progressive number incremented for each file.

Target Error. This value determines the precision, as a percentage, for maintaining the set level of contraction. The value can be set at between 1 and 9%.

Reset Counters. Press OK when this item is selected in the menu to reset the counters for the progressive numbering of the data files saved on the I-TECH PHYSIO EMG.

Handling and care

Charging the battery

The display shows when the battery is low:

Batteries fully charged Batteries partially discharged Batteries fully discharged

BATTERIA SCARICA (battery low) appears on the display when the batteries run low.
In this case, connect the battery charger to the relative connector on the small rear panel of the device. To replace the battery, please contact the manufacturer or a specialist technical centre. Replace the battery only with one of the same model provided by the manufacturer.

Cleaning the equipment

Use a soft dry cloth to remove dust.
Use a small sponge dampened with a water and alcohol solution to remove any stubborn stains.
WARNING: never clean the device when it is in operation. Disconnect the device from the battery charger and disconnect all the connection cables before cleaning the device.

Always observe the recommendations above and contact the manufacturer for information on any other cleaning/maintenance operations.

Operation, transport and storage

The device is designed to operate in the following ambient conditions:

ambient temperature	+0 to + 40 °C
relative humidity	10 to 93%
pressure	700 to 1060 hPa

Precautions for transport

No special precautions need to be taken for transport because the I-TECH PHYSIO 4/EMG is a portable device.

It is advisable to always put the I-TECH PHYSIO 4/EMG and its accessories back in the carrying case provided after use.

Precautions for storage

The equipment is designed to withstand the following ambient conditions (with or without the case provided):

ambient temperature	-25 to + 70 °C
relative humidity	up to 93%
pressure	700 to 1060 hPa

Information on disposal

The product is subject to the WEEE regulations (as indicated by the symbol on the label) concerning differentiated waste collection: take the product to an electronic waste recycling centre or contact the manufacturer.

Maintenance and troubleshooting

The equipment does not require any particular routine maintenance when used in the manner indicated in this manual.

It is advisable to have the device inspected by the manufacturer once every 24 months in order to guarantee correct operation and compliance with the requirements concerning safety and efficiency.

If any faults or problems occur during use of the I-TECH PHYSIO 4/EMG, please refer to the troubleshooting guide below:

- **The I-TECH PHYSIO 4 does not turn on.** Check that the battery is not dead (refer to the section "Charging the battery"). If the problem persists please contact the manufacturer.
- **The I-TECH PHYSIO 4/EMG does not transmit electrical impulses.**Check all the connections, cables and applicators as indicated in this manual. If the problem persists please contact the manufacturer.
- **The I-TECH PHYSIO 4/EMG turns itself off during operation.**Check the battery to see if it is low, contact the manufacturer.

Assistance

Please contact the manufacturer for all technical assistance regarding the equipment. To request technical assistance, contact:

I.A.C.E.R. S.r.l.
Via S. Pertini, 24/a • 30030 Martellago (VE)
Tel. +39 041.5401356 • Fax +39 041.5402684

Technical documents concerning repairable parts can be provided only with the consent of the company and only when the personnel entrusted with maintenance have received appropriate training.

Spare parts

The manufacturer can provide original spare parts for the equipment at any time. To request spare parts:

I.A.C.E.R. S.r.l.
Via S. Pertini, 24/a • 30030 Martellago (VE)
Tel. +39 041.5401356 • Fax +39 041.5402684

Under the terms of the warranty, and in order to ensure the safety and efficiency of the product, it is recommended to use only original spare parts provided by the manufacturer (refer also to the section "Warnings").

Warranty

The I-TECH PHYSIO 4/EMG comes with a 2-year warranty valid from the date of purchase that covers the electronic parts. The warranty covers the parts prone to wear (like the battery) only in terms of manufacturing defects. The warranty is rendered null and void if the equipment is tampered with or serviced by personnel not authorised by the manufacturer or retailer.
In the case of repairs under the terms of the warranty, the equipment must be packed to protect it against damage during transport and shipped to the manufacturer together with all the accessories. Under the terms of the warranty, the purchaser must return the equipment to be repaired together with the receipt or invoice as proof of the provenance and date of purchase of the product.

The manufacturer is obliged, in accordance with the Medical Device Directive 93/42/EEC, to ensure the traceability of all the equipment supplied in order to promptly fix manufacturing defects when necessary.

Terms of the warranty.

1. The warranty covers the repair of defective goods only when these are returned together with the tax receipt or purchase invoice.
2. The warranty covers the electronic parts for a period of 2 (two) years. The warranty is provided by the retailer/distributor or can be requested directly from the manufacturer.
3. The warranty covers only damage to the product that affects operation. The warranty is valid only if the product concerned bears the same serial number as that indicated on the tax receipt or purchase invoice.
4. The warranty covers only the repair or replacement, free of charge and including labour, of any components found to have manufacturing or material defects.
5. The warranty does not cover damage caused by carelessness or failure to observe the instructions provided, damage attributable to repairs by unauthorised personnel, damage due to accidental causes or the negligence of the purchaser, with regard to the external parts in particular.
6. The warranty also does not cover damage to the equipment caused by an inappropriate power supply.
7. Parts prone to wear due to use are not covered by the warranty.
8. The warranty does not include the cost of transport which can vary according to the mode and time of transportation and is to be borne by the purchaser.
9. The warranty is valid for 2 years. The purchaser is then billed for the cost of replaced parts, labour and transport according to the rates in force.
10. All disputes shall fall under the jurisdiction of the Court of Venice.

Aspetti di emissione		
Prova di emissione	**Conformità**	**Ambiente elettromagnetico - guida**
Emissioni RF Cispr 11	Gruppo 1	Il prodotto I-TECH PHSYIO EMG utilizza energia RF solo per il suo funzionamento interno. Perciò le sue emissioni RF sono molto basse e verosimilmente non causano interferenze negli apparecchi elettronici vicini.
Emissioni RF Cispr 11	Classe B	Il prodotto I-TECH PHSYIO EMG è adatto per l'uso in tutti gli edifici diversi da quelli domestici e da quelli collegati direttamente ad una rete di alimentazione a bassa tensione che alimenta gli edifici per uso domestico E' possibile utilizzare l'apparecchio in tutti gli edifici, compresi gli edifici domestici, e quelli direttamente collegati alla rete di alimentazione pubblica in bassa tensione che alimenta edifici per usi domestici.

Aspetti di immunità			
Il prodotto I-TECH PHSYIO EMG è previsto per funzionare nell'ambiente elettromagnetico sotto specificato. Il cliente o l'utilizzatore dovrebbe assicurarsi che esso venga usato in tale ambiente			
Prova di immunità	**Livello di prova EN 60601-1-2**	**Livello di conformità**	**Ambiente elettromagnetico - guida**
Scariche elettrostatiche (ESD) EN 61000-4-2	± 6kV a contatto ± 8kV in aria	± 6kV a contatto ± 8kV in aria	I pavimenti devono essere in legno, calcestruzzo o in ceramica. Se i pavimenti sono ricoperti di materiale sintetico, l'umidità relativa dovrebbe essere almeno del 30 %
Campo magnetico alla frequenza di rete EN 61000-4-8	3 A/m	3 A/m	I campi magnetici a frequenza di rete dovrebbero avere livelli caratteristici di una località tipica in ambiente commerciale o ospedaliero.

Aspetti di immunità a r.f.

Il prodotto I-TECH PHSYIO EMG è previsto per funzionare nell'ambiente elettromagnetico sotto specificato. Il cliente o l'utilizzatore dovrebbe assicurarsi che esso venga usato in tale ambiente

Prova di immunità	Livello di prova EN 60601-1-2	Livello di conformità	Ambiente elettromagnetico - guida
RF Condotta EN 61000-4-6	3 Veff da 150kHz a 80MHz	3 Veff da 150kHz a 80MHz	Gli apparecchi di comunicazione a RF portatili e mobili non dovrebbero essere usati vicino a nessuna parte dell'apparecchio, compresi i cavi, eccetto quando rispettano le distanze di separazione raccomandate calcolate dall'equazione applicabile alla frequenza del trasmettitore Distanze di separazione raccomandate d = 1,2 √P da 150kHz a 80MHz d = 1,2 √P da 80 MHz a 800 MHz d = 2,3 √P da 800 MHz a 2,5 GHz ove P è la potenza massima nominale d'uscita del trasmettitore in Watt (W) secondo il costruttore del trasmettitore e d è la distanza di separazione raccomandata in metri (m).
RF Radiata EN 61000-4-3	3 Veff da 80MHz a 2,5GHz	3 Veff da 80MHz a 2,5GHz	

L'intensità del campo dei trasmettitori a RF fissi, come determinato in un'indagine elettromagnetica del sito, potrebbe essere minore del livello di conformità in ciascun intervallo di frequenza.
Si può verificare interferenza in prossimità di apparecchi contrassegnati dal seguente simbolo:

Distanza di separazione raccomandata tra gli apparecchi di radiocomunicazione portatili e mobili e l'apparecchio DISPOSITIVO

Il prodotto I-TECH PHSYIO EMG è previsto per funzionare in un ambiente elettromagnetico in cui sono sotto controllo i disturbi irradiati RF. Il cliente o l'operatore dell'apparecchio possono contribuire a prevenire interferenze elettromagnetiche assicurando una distanza minima fra gli apparecchi di comunicazione mobili e portatili a RF (trasmettitori) e l'apparecchio, come sotto raccomandato, in relazione alla potenza di uscita massima degli apparecchi di radiocomunicazione.

Potenza di uscita nominale massima del trasmettitore (W)	Distanza di separazione alla frequenza del trasmettitore (m)		
	Da 150kHz a 80MHz d = 1,2 √P	Da 80MHz a 800MHz d = 1,2 √P	Da 800MHz a 2GHz d = 2,3 √P
0,01	0,12	0,12	0,23
0,1	0,38	0,38	0,73
1	1,2	1,2	2,3
10	3,8	3,8	7,3
100	12	12	23

Per i trasmettitori con potenza nominale massima di uscita sopra non riportata, la distanza di separazione raccomandata d in metri (m) può essere calcolata usando l'equazione applicabile alla frequenza del trasmettitore, ove P è la potenza massima nominale d'uscita del trasmettitore in Watt (W) secondo il costruttore del trasmettitore.

Nota:
(1) A 80 MHz e 800 MHz si applica l'intervallo della frequenza più alta
(2) Queste linee guida potrebbero non applicarsi in tutte le situazioni. La propagazione elettromagnetica è influenzata dall'assorbimento e dalla riflessione di strutture, oggetti e persone.

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